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Industrial Health, Occupational Medicine and Traumatic Surgery

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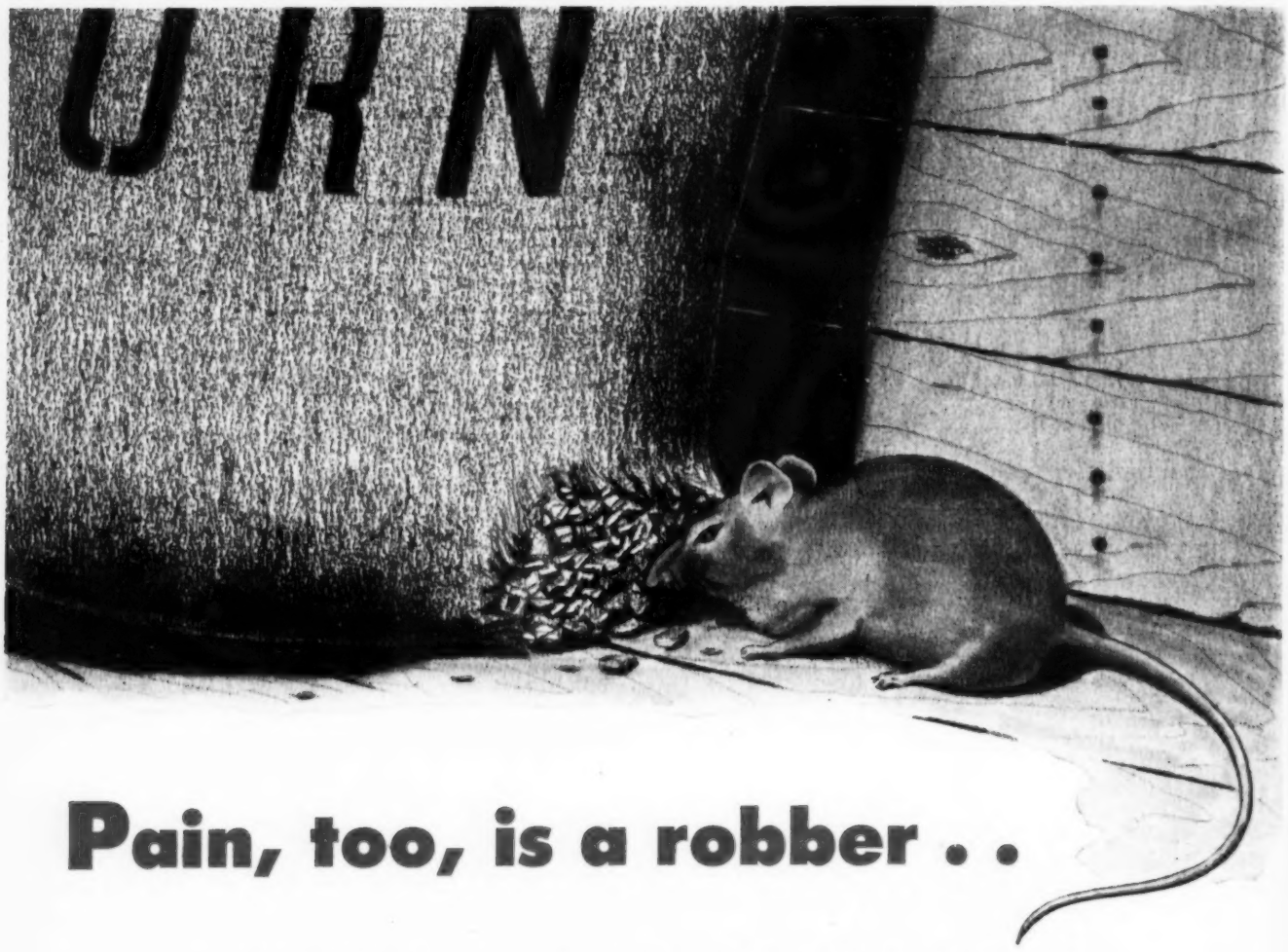

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A LITTLE more common sense and a little less politics would present the reconversion situation in its true light. Why, for example, the tender solicitude for those who have to find new work because their war jobs are done, as against the brushoffs being given the returning soldiers who didn't have a job before they went into the service. Lives were expendable on the war front and, bitter as it was, every one had to accept it as inevitable. Likewise, jobs and facilities were expendable on the industrial front and, bitter as it may be, every one must accept it also as inevitable. Lives can't be restored and—unfortunately for the freedom of opportunity in an unregimented land for which they died—the thousands who lie under the white crosses can't vote. They are safe from fear, and out of reach of the propaganda which is playing up fear from sinister motives. It is safe to say that if they were here they wouldn't be afraid of the future of a nation where there now exist 130 billions of domestic bank deposits, 27 billions hoarded in private possession, scores of billions invested in war savings bonds, 10 million young families wanting to start their homes, and 30 million families clamoring for things they haven't been able to buy during the war. Why should anyone be afraid? According to the AFL, in 1939, before the United States began production for defense, there were more than 10 million unemployed. Now the maximum estimate by the most pessimistic of the totalitarian-minded can only reach eight million by adding together the total of separations from war work, without regard for the large majority of these who will quickly get into other jobs. Reconversion is not to be feared; it is to be welcomed. Each business has its own reconversion problems; we have ours. Right now we have more type to be set and print-

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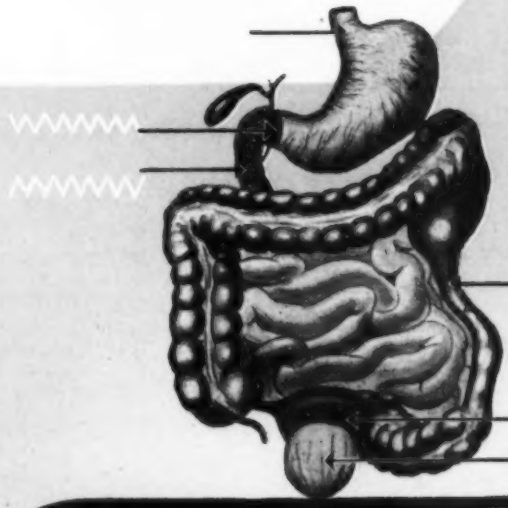

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RESEARCH IN THE SERVICE OF MEDICINE

—*Continued from page 3.*

ing work to be done than we can find men to do it. Possibly this is a good omen for the reconversion feature of industrial medicine as a whole. We have never feared this period in our field, and all the signs confirm our feeling of confidence that, while industrial medicine in general may experience a little reorganization as a preliminary to greater expansion, it didn't need any particular period of reconversion and won't experience any. As an indication of the future, we have a letter from a sizable concern reading as follows: "We are currently planning on expanding our health program and medical department and, consequently, have need for the services of a qualified industrial physician on a full-time basis to head up this program. Since we are a well established organization with an unusually bright postwar future, the position of medical director will be a permanent one in our organization." Those who are genuinely interested in the possibilities of extensive and actual unemployment in the immediate future might give some thought to the personal characteristics of those who remain unemployed long enough to create a problem. For example, in "Trial by Ordeal—From an Industrialist's Viewpoint," (page 701) HOWARD COONLEY says, "Never in my 40 years in industry have I found an excess supply of men and women prepared for rapid advancement through personal characteristics, latent abilities, and willingness to assume responsibility. . . ." The thought contained in this statement is particularly commended to union leaders. . . . WE HEREBY call attention to the footnotes—in each instance at the bottom of the column—under the headings of certain articles, particularly the articles in the department "Industrial Health and Disease." These footnotes are intended to give credit to the source from which the article came—the author or authors, and the journal of original publication. The articles are chosen from among the hundreds of other magazines which we survey every month, because of their possible interest to the readers of this magazine; and our republication of them in these columns is designed to enable our readers to keep in touch as nearly as may be with the important things that are being said and done everywhere and by everybody concerning industrial medicine. In this issue we have (1) simultaneous publication with the *Journal of the Medical Association of the State of Alabama* of the very fine study by DR. TABERSHAW and MR. TEBBENS on the use of aluminum in silicosis control, page 709; (2) the excellent discussion of new aspects and approaches to the problem of dust diseases, by DR. DERNEHL and DR. NAU, from *Texas Reports on Biology and Medicine*, page 744; (3) the analysis of gynecology in industry, by DR. PETERS and DR. FOOTER, from the *Permanente Foundation Medical Bulletin*, page 755; (4) the dynamics of mental hygiene in industry, by DR. BRODY, from *Mental Hygiene*, page 760; and (5) industrial health in small plants in the Borough of Queens, by DR. MENCKEN, from *Queensborough*, the publication of the local Chamber of Commerce, page 774. Our purpose in mentioning these footnotes is to emphasize that it is our custom to give full credit in this manner, and to remind readers that *such credit is customarily given.*

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PERSONAL

DR. JAMES H. STERNER, Medical Director, Clinton Engineer Works — Tennessee Eastman Corporation Division, Oak Ridge, Tennessee, has been appointed Consultant in Industrial Medicine for the same organization. He is maintaining his status as Industrial Hygienist for the Eastman Kodak Company, and as Consultant for the Tennessee Eastman Corporation at Kingsport, Tennessee.

DR. HAROLD H. STEINBERG has resigned as Medical Director of Peoples Gas Light & Coke Company, Chicago. DR. STEINBERG will remain as consultant for this company, and will establish his own practice as consultant in industrial medical and medicolegal work.

DR. CHRISTOPHER LEGGO, Assistant Director, Clinton Engineer Works, Tennessee Eastman Corporation, was appointed Medical Director of that company on June 1, 1945.

DR. LEWIS L. KLINE, formerly Head of the Diagnostic Division of the Medical Department of Chrysler Corporation, has lately been appointed Director of the Industrial Hygiene Laboratories of Chrysler Corporation, Detroit.

DR. T. LYLE HAZLETT, Medical Director, Westinghouse Electric & Manufacturing Company, is a member of the Executive Committee of National Safety Council and of the Medical Committee of Industrial Hygiene Foundation. Having been appointed as liaison officer between the two organizations, DR. HAZLETT recently arranged a meeting of their representatives, as a result of which a working agreement for closer and more practical collaboration between them was developed, the agreement providing for the exchange of publications and information, for mutual assistance on research, and for the referral of inquiries and requests for services on industrial health and safety to the organizations most directly concerned.

DR. ROBERT A. KEHOE, Head of the Department of Applied Physiology, College of Medicine, University of Cincinnati, is among the medical experts, of whom there are 12, from universities and pharmaceutical manufacturers, comprising the more than 200 American technical experts now in Europe investigating Germany's technical industrial war secrets under the direction of the Joint Chiefs of Staff and in conjunction with the FEA and other govern-

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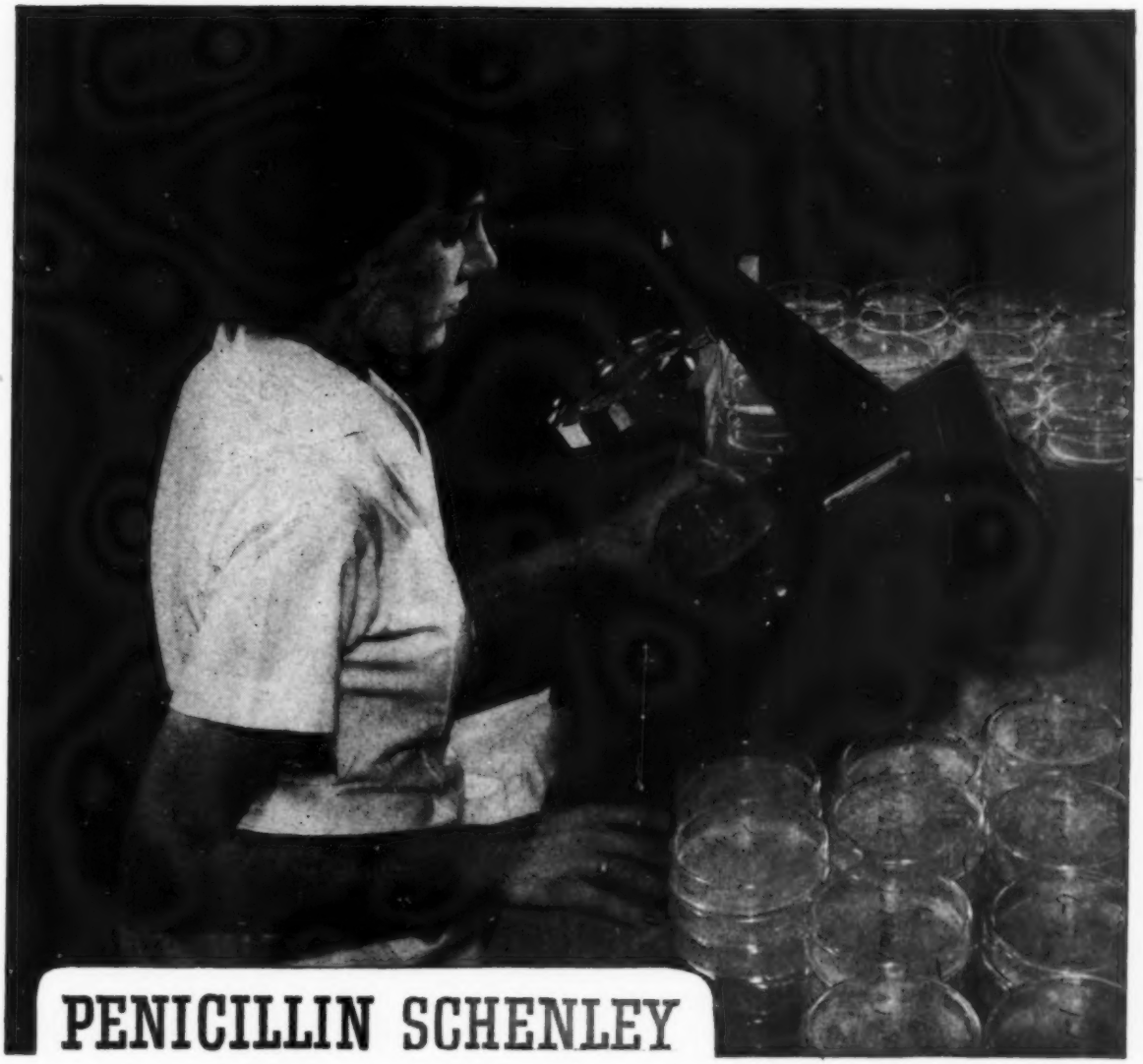

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ment agencies. Important information already has been obtained and some investigators have completed their work and returned. However, the greater number still are overseas and others are going over. Many were in Germany under a pledge of secrecy before VE Day, gathering technical industrial information before the enemy had a chance to destroy documents or equipment. The technicians were under an urgent directive to search out German industrial processes, inventions, engineering, and "know-how" required to aid U. S. war production.

—Release, Foreign Economic Administration, July 29.

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GENERAL

MEDICAL Uses of Soap, edited by MORRIS FISHBEIN and published by J. B. Lippincott Company, was reviewed by WILLIAM RUFUS REDDEN, M.D., in INDUSTRIAL MEDICINE for February, 1945. The entire first printing of this authoritative work was purchased by the Procter & Gamble Company, and is available free to physicians. A request on your letterhead addressed to Public Relations Department, The Procter & Gamble Company, Cincinnati 1, Ohio, will bring you the book.

Industrial Hygiene Foundation

THE Tenth Annual Meeting of the members of the Industrial Hygiene Foundation will be held at Mellon Institute, Pittsburgh, on November 14 and 15, 1945.

Medical Papers

AMERICAN Mutual Liability Insurance Company announces release of the printed proceedings of the two War Seminars on Industrial Medicine and Surgery which were held by that company in 1944 in Atlanta and Chicago. In this second report are the following medical papers: Intervertebral Disc Injury: Analysis From An Industrial Standpoint, by DR. HENRY C. MARBLE, Surgical Director, American Mutual, and DR. WILLIAM A. BISHOP, the late Medical Director of the American Mutual Clinic in Boston; Aluminum Therapy in Silicosis, by DRS. LEROY U. GARDNER, MORRIS DWORSKI, and ANTHONY B. DELAHANT, all of the Saranac Laboratory for the Study of Tuberculosis; Health Hazards of Electric Welding, by DR. O. A. SANDER, of Milwaukee, Wisconsin; Important Features in the Treatment of Fractures, by DR. ALLEN F. VOSHELL, Professor of Orthopedic Surgery, University of Maryland.

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Other papers included in the volume are: The Use of Physiologic Salt Solution, Plasma and Whole Blood in the Treatment of Injured Persons, by DR. EUGENE A. STEAD, JR., and The Effects of Sulfonamide on the Blood, by DR. ROY R. KRACKE, both from Emory University, School of Medicine; Penicillin Therapy, by DR. WALTER S. PRIEST, of Chicago; Malaria in Returning Troops, by DR. STANLEY FREEBORN, and Filariasis by DR. WILLIAM S. BOYD, both of the U. S. Public Health Service, Atlanta.

Dearth of Psychiatrists

SOME "startling" facts as to the lack of psychiatric facilities throughout the country are revealed in the 35th annual report of the National Committee for Mental Hygiene, published recently. With the assistance of the Commonwealth Fund, the Committee's Division of Rehabilitation, of which DR. THOMAS A. C. RENNIE is Director, made a survey of the psychiatric resources of the country. It was found, among other things, that there are 25 states without a single community clinic, and there are vast areas in other states where no psychiatric help is available. . . . The 30 neuropsychiatric hospitals operated by the Veterans Administration are in general seriously overcrowded, but the most serious deficiency has been found in outpatient treatment provided by these institutions. It is estimated that at least 10,000 additional psychiatrists, if available, could be fully utilized in an adequate national program.

—*West Virginia Med. J.*, August, 1945.

Ammonia

THE Division of Labor Standards, United States Department of Labor, has inaugurated a series of bulletins on Controlling Chemical Hazards in cooperation with the Manufacturing Chemists Association of the United States. The first bulletin, "Ammonia," is just off the press and others shortly to be issued cover chlorine, sulphuric and nitric acids, formaldehyde, and the anilines. There will be over 100 such bulletins in the series, which is designed for safety men in industry, insurance companies, and state labor departments, for union safety committees, and for materials warehousemen, handlers on railroads and trucking concerns, industrial

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*Ann. of Surg. 117:885 (June) 1943.

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TO provide an organization, not for pecuniary profit, in which all agencies and societies, both medical and lay, concerned with the problems of industrial health can hold membership and can meet together in conference for the study, discussion and careful consideration of all industrial health problems and procedure; to engage in scientific research to determine the cause, nature, prevention and cure of diseases and injuries of occupations; to assist in establishing and supervising industrial health clinics to serve small industries; to establish and maintain hospitals which will furnish facilities for the care, treatment and study of occupational injuries and diseases; to make surveys of industrial medical services and recommendations for their improvement; to solicit, receive and administer funds for any purpose that will advance and/or improve industrial health; to establish undergraduate and/or post-graduate courses in industrial medicine and surgery and/or to cooperate with medical schools and industries in maintaining such courses; and to use all those means, which from time to time, may seem wise, for the advancement of industrial health.

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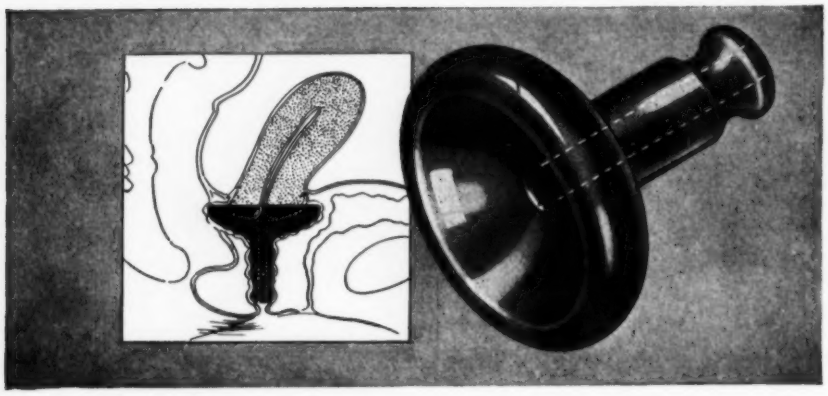

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Costly Colds

ONE hundred million working days are lost to American industry each year on account of the common cold, reports JOSEPH H. KLER, M.D.,* and the cost is somewhere between a half and two billion dollars annually. This expensive nuisance is also one of the most mysterious, since little is actually known about its exact cause, its prevention and its cure. Of course, almost everyone has his particular system for beating a cold, but the statistical analysis prepared by DR. KLER explodes some of the favorite theories. For instance, DR. KLER finds that smoking has very little effect on colds; staying home when a cold breaks has no apparent effect on the duration of a cold (although it is certainly easier on your working associates). DR. KLER reports, however, fewer colds in air conditioned plants, and confirms that more colds start in draughty places. Posture is important, too, as people who walk about during their work contract fewer colds than those who sit all day. Women have more colds than men and they are severer, but the incidence in both men and women decreases with age. Strangely enough, more colds start on Monday than any other day in the week, particularly among men. (Perhaps this isn't so strange after all, since fatigue seems to be a factor in lowering resistance.)

—Office of Pharmacal Information, Bulletin No. 5.

*"An Analysis of Colds in Industry," by JOSEPH H. KLER, M.D., in *Archives of Otolaryngology*, 41:6, 395-407, June, 1945.

Institute of Industrial Medicine

ESTABLISHMENT of two more institutes at the University of Chicago as a direct outgrowth of work done at the university in connection with the development of the atomic bomb was announced yesterday by Chancellor Hutchins. They will be an institute for the study of nuclear physics and an institute of metals. Dr. Samuel K. Allison, present professor of physics at the university, will head the institute for nuclear study, and the metals institute will be directed by Cyril Smith, former research metallurgist for the American Brass Company. The university also will create at once two new units, which later may become departments or even institutes, Dr. Hutchins said: a unit of industrial health and a unit of applied mathematics. Creation of the new units is necessitated because of the fields opened by the university's program in nuclear research.

—*Chicago Tribune*, August 10, 1945.

Industrial Eye Accidents

THERE are more than 300,000 industrial eye accidents in the United States annually, of which 60,000 are compensable. These figures are even more striking if we realize that approximately 1,000 workers lose the sight of one eye and approximately 10 workers lose the sight of both eyes each year.

—*Medical Times*, 1945.

Industrial Hygiene Conference

A REGIONAL Industrial Hygiene Conference, to be sponsored by the Bureau of Industrial Hygiene, Pennsylvania Department of Health, will be held at the Benjamin Franklin Hotel, Philadelphia, on September 25 and 26. Industrial Hygiene personnel from New York, New Jersey, Maryland, West Virginia and Pennsylvania will participate. Personnel of the U. S. Public Health Service, as well as representatives of management, labor and the industrial medical profession will also appear on the program, which is as follows:

Introductory

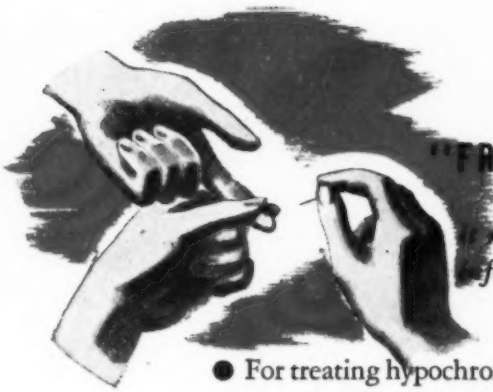
PRESIDING, DR. JOSEPH SHILEN, Director, Bureau of Industrial Hygiene, Pennsylvania Department of Health.

DR. A. H. STEWART, Secretary of Health, Commonwealth of Pennsylvania.

DR. RUFUS S. REEVES, Director of Public Health, City of Philadelphia.

September 25

CHAIRMAN, DR. T. LYLE HAZLETT, Medical Director, Westinghouse Electric Corporation; Professor of Industrial Hygiene, University of Pittsburgh Medical School.



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FACTS ABOUT HEMO-GENIN

COMPOSITION: Fergon (Ferrous Gluconate Stearns), synthetic vitamin B complex factors, and liver concentrate. Six capsules daily supply 12 gr. ferrous gluconate and the daily requirement of B vitamins.

NON-IRRITATING to gastro-intestinal mucosa because low degree of ionization makes it virtually non-astringent. May be administered before meals to facilitate maximum absorption.

GREATER iron utilization shown by clinical comparison of ferrous gluconate with other iron salts.†

†J. Clin. Investigation 16:547, 1937.

INDICATED in hypochromic anemias requiring iron and vitamin B complex. Especially valuable when patients do not tolerate other forms of iron.

DOSAGE: Two capsules three times daily, before or after meals.

SUPPLIED in bottles of 100 and 500 capsules.

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*J.A.M.A. 123:1007, 1943.

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Radium Dial Painting Control Methods—MR. FRANK J. WILLARD, JR., Industrial Hygiene Engineer, Bureau of Industrial Hygiene, Pennsylvania Department of Health.

Are Dust Counts Made by Different Laboratories Comparable—MR. PAUL D. HALLEY, Industrial Hygiene Engineer, Bureau of Industrial Hygiene, West Virginia Department of Health.

Engineering Control Methods—MR. E. C. BARNES, Industrial Hygiene Engineer, Westinghouse Electric Corporation, Pittsburgh.

Prevention of Oral Diseases of Occupational Origin—DR. LYMAN D. HEACOCK, Senior Dental Surgeon (R), Chief, Dental Unit, Division of Industrial Hygiene, U. S. Public Health Service.

Medicolegal Aspects of Occupational Diseases—HON. DANIEL G. MURPHY, Chairman, Workmen's Compensation Board, Pennsylvania Department of Labor and Industry.

CHAIRMAN, DR. W. F. REINDOLLAR, Director, Division of Industrial Hygiene, Maryland Department of Health.

Prevention of Industrial Dermatoses—DR. LOUIS SCHWARTZ, Medical Director, Chief, Dermatoses Section, USPHS.

Illness in Industry—DR. CHARLES-FRANCIS LONG, Chairman, Industrial Hygiene Committee, Medical Society of the State of Pennsylvania; Medical Director, Bayuk Cigar Company, Philadelphia.

Industrial Nursing—MRS. MARION MANGENE, R.N., Past President, Member Board of Directors, Industrial Nursing Association of Philadelphia; Chief Nurse, Vogt & Son Packing Company, Philadelphia.

Dust Concentrations in Stone Crushing Operations—MR. A. C. STERN, (JACK BALIFF, A. E. PERINA), Division of Industrial Hygiene, New York Department of Labor.

Pennsylvania Bureau Activities—DR. JOSEPH SHILEN, Director, Bureau of Industrial Hygiene, Pennsylvania Department of Health.

Round Table Discussion—Presiding, DR. J. G. TOWNSEND, Medical Director, Chief, Division of Industrial Hygiene, USPHS.

September 26

CHAIRMAN, DR. W. S. MCELLROY, Dean, University of Pittsburgh Medical School.

Industrial Health in Small Plants—DR. GLENN S. EVERTS, 1st Councilor District Member, Industrial Health and Hygiene Committee, Medical Society of the State of Pennsylvania, Philadelphia.

Medical Criteria in the Reconversion Program—DR. HARVEY BARTLE, Formerly Medical Director, Pennsylvania Railroad System, Philadelphia.

Integration of Industrial Health in the Public Health Program—MR. J. J. BLOOMFIELD, Senior Sanitary Engineer, Assistant Chief, Division of Industrial Hygiene, U. S. Public Health Service.

Value of Industrial Health to Management—DR. VICTOR HEISER, Consultant on Industrial Health, N.A.M., New York City.

Value of Industrial Health to Labor—MR. JAMES L. MCDEVITT, President, Pennsylvania Federation of Labor; MR. JOHN A. PHILLIPS, President, Pennsylvania Industrial Union Council.

CHAIRMAN, DR. W. E. DOYLE, Surgeon (R), Chief, Medical Unit, Division of Industrial Hygiene, U. S. Public Health Service.

Environmental Conditions in Plants Molding Lead Plastic Bullets—DR. L. A. KAGEN and MR. E. L. SCHALL, Bureau of Industrial Hygiene, New Jersey Department of Health.

Toxicity of Some of the Newer Plastics—DR. A. G. CRANCH, Industrial Toxicologist, Union Carbide and Carbon Corporation, New York City.

Mental Health in Industry—DR. C. C. BURLINGAME, Psychiatrist-in-Chief, The Institute of Living, The Neuro-Psychiatric Institute of the Hartford Retreat, Hartford, Connecticut.

Industrial Ophthalmology—DR. CHARLES F. KUTSCHER, Associate Professor of Ophthalmology, University of Pittsburgh Medical School; Ophthalmologist, Carnegie-Illinois Steel Corporation, Pittsburgh.

Industrial Exposure to Butanol

IRVING TABERSHAW, J. P. FAHY and J. B. SKINNER (*Journal of Industrial Hygiene*, 26:328, December, 1944) report a study of industrial exposure to butanol in six plants producing waterproof products. It was found that concentration of butanol above 50 p.p.m. in the atmosphere of the workroom caused inflammation and irritation of the eyes; in concentrations at higher levels (near 100 p.p.m.) ocular inflammation occurs frequently and is sufficiently severe to cause loss of working time and disturb production schedules. In the plants studied, the concentration of butanol in the atmosphere did not much exceed 100 p.p.m. At this level of concentration, serious systemic effects are not to be expected. The workers stated, however, that the odor of the vapor was disagreeable and in some cases caused headache and slight vertigo. The vapor is also somewhat irritating to the nose and throat. Dermatitis occurred frequently; it is characterized by a fissured excema, especially around the finger nails and along the sides of the fingers. It was found that this could be almost entirely prevented by the use of a protective ointment before work and the application of a panolin emollient after work. No symptoms caused by butanol, other than the ocular symptoms, were severe enough to cause absenteeism. Comment: This article indicates the importance of making quantitative atmospheric studies in industrial plants. Adequate ventilation and useful protective devices should be provided.

—E.G.B., in *Medical Times*, August, 1945.

At Last

WITH the nation facing a serious shortage of doctors and dentists in the postwar period, Paul V. McNutt, chairman of the War Manpower Commission, on August 20 announced plans to enroll immediately 12,000 students for medical, dental, pre-medical and pre-dental school courses beginning this fall from among veterans now being discharged from the armed services.

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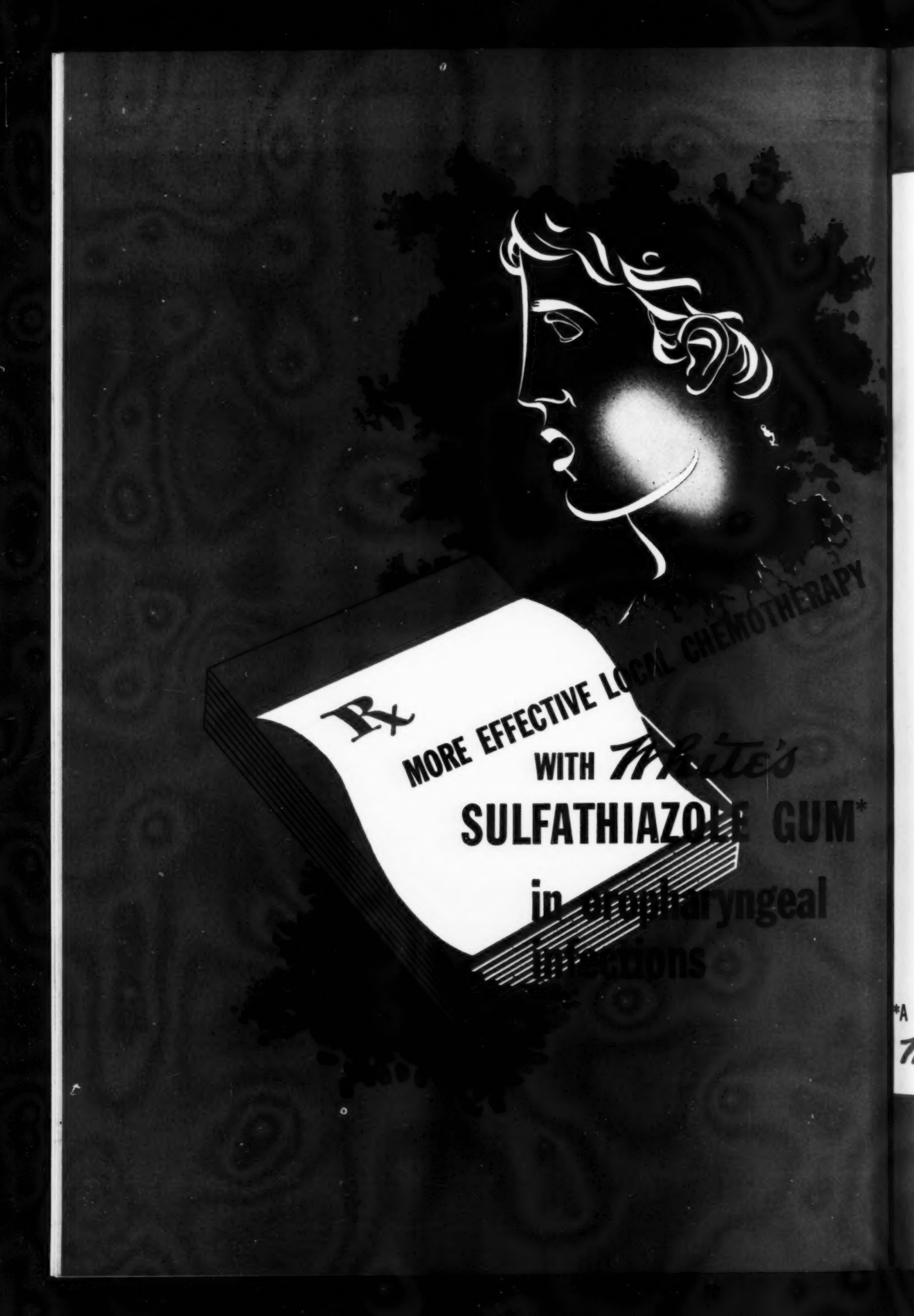
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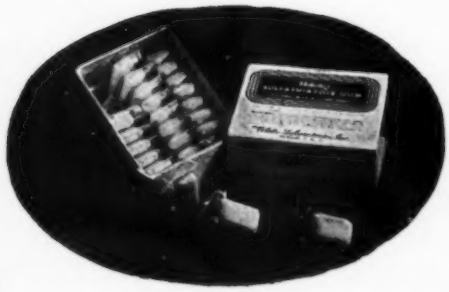

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COMMENT and OPINION

THE greatest difficulty with which we are confronted in attempting to reduce the numbers of the physically unfit in a democracy is the freedom of the individual to neglect himself.

—*New England J. Med.*, August 2, 1945.

Psychiatry Panic

DR. C. CHARLES BURLINGAME, after a nation-wide survey of veterans' employment problems for the National Association of Manufacturers, said that the country is in a "psychiatric panic" as regards the returning veteran. He said that all the books on treatment of the returning veterans "which the wives and sweethearts of the men are reading" should be burned.

—*Chicago Sun*, August 10, 1945.

Public Inertia

I DO NOT want to appear to be a pessimist, or one opposed to public health. However, my experience with the public and my persistent endeavor to get defects corrected in early life convince me that something is lacking somewhere. People will spend plenty of money to keep an old, worn-out car on the road, but when it comes to the human body, for which we have no replacement parts at any time, they will procrastinate and tighten their purse strings. I refer to dental work, especially malocclusion and high arch palates—think of the numerous tonsillectomies which have been performed when dentistry was indicated! Speech impediment is frequently due to these conditions. Then, think of the hearing defects that could be prevented if diseased tonsils were removed more often. The attitude of the public and their dilly-dallying habits and indifference makes me appear a pessimist.

—R. E. WYNNE, M.D., Bedford, Indiana, "Facts Developed by Selective Service Examinations," in *J. Indiana State M. A.*, July, 1945.

The Halfway Mark

THE first half of 1945 has shown many worth while accomplishments in protecting the health and safety of the workers within Westinghouse. The statistics show a reduction in the frequency of accidents over the first half of 1944. The excellent eye protection program, most active throughout the corporation, has resulted in not one eye being lost against five lost at this time last year—humane and economical. Many of the plants are now able to go long periods without a disabling accident. We are hitting our stride; keep moving forward. We can look with a great deal of satisfaction on the job being done by the Manufacturing and Repair Department. Better medical facilities, more complete safety organizations, and a keener interest by management and workers have resulted in reducing the frequency of accidents within the division almost 50% this year. Five of the districts have qualified for the U. S. Department of Labor award for reducing the frequency of their accidents 40% over the same period last year. It shows what can be done when a division makes up its mind that accidents can be prevented.

—T. LYLE HAZLETT, M.D., in *Westinghouse Safety News*, August, 1945.

Alcohol and Efficiency

A PRELIMINARY study of alcohol and industrial efficiency: The following is a condensation of the preliminary survey submitted by McKinsey and Company. The purpose of the survey was to determine if possible: (1) Whether a detailed study would be desirable and whether the present time would be favorable for undertaking it. (2) What facts businessmen would regard as significant and feasible to gather. (3) What help could be expected from employers and workers for such a study at this time. As a preliminary to field investigations as planned, a letter was sent to 100 concerns chosen as a representative cross section of the most likely field for such a study. All but one reply to the mailed questionnaire definitely indicated a belief on the part of the respondents that a scientific study of the relation of alcoholism to production would not be justified at this time. Managers of large, medium and small plants indicated that there was some drinking, but they believed that company regulations and union agreements acted effec-

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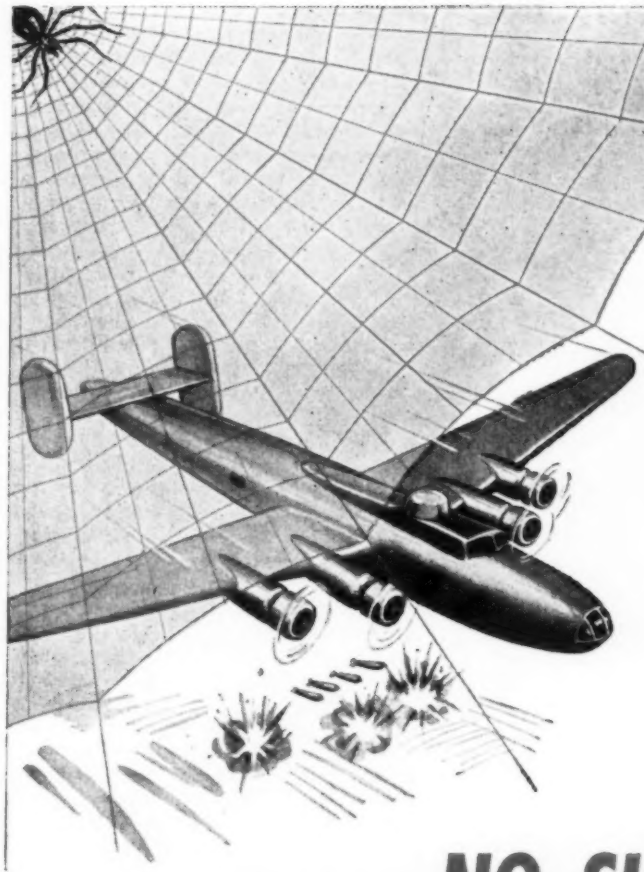

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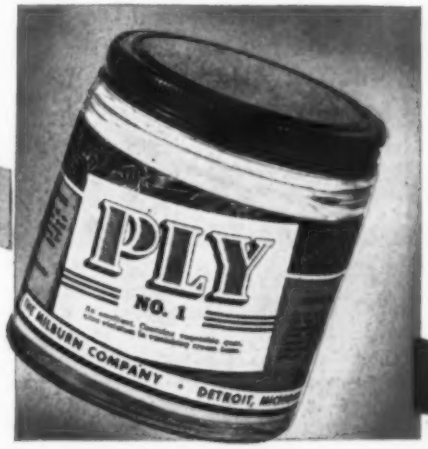

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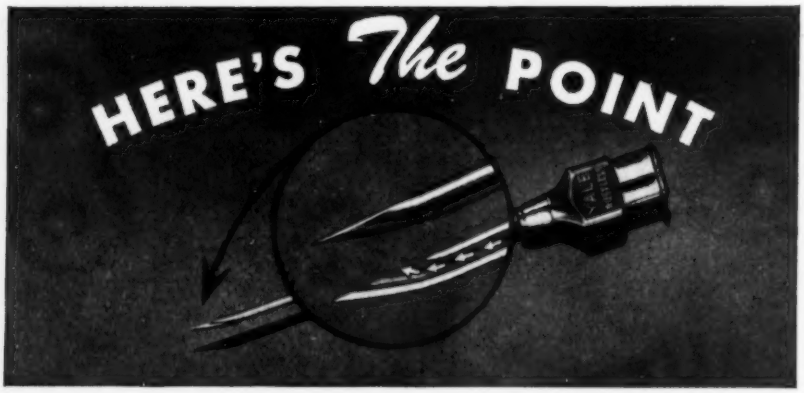

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tively to control the drinking tendencies of the workers to such a degree that their over-all effect on production is so small as not to constitute a problem. In addition to this mail questionnaire, several former clients with whom we were on cordial and frank terms were approached on a personal basis for the purpose of learning whether interviews with personnel managers, plant operating heads or others could be arranged. These uniformly took the position that their relations with labor were such that they considered it unwise to raise the issue of drinking practices at this time. The pressure of war work and the sensitiveness of labor leaders to any raising of inquiries involving personal privilege were the two main reasons given. The reluctance of labor leaders to having any inquiry made at this time was emphasized by two labor men interviewed. We have discussed this matter with individuals directly associated with the United Automobile Workers of America and in an advisory capacity to various garment workers' unions. They stated, in the case of automobile workers, that they recognized that drinking did have a slight effect on production; and, in the case of the garment workers, that there was probably less drinking in these groups than in any other trades. But both individuals expressed the opinion, which we regarded as significant, that their unions and others would not support any undertaking such as this, which might cause workers to think that their personal habits were being investigated. The significance of this position by the unions is that efforts to have factory workers fill out any questionnaire (on this or any other problem) would be most likely to fail—because, with such close collaboration as exists today between management and the representative of labor, neither side would permit it without the approval of the other. In times like these, it would be hopeless to endeavor to get an agreement on a matter such as this, with both sides feeling as they do about the relative lack of urgency in the question. Interviews with plant operating men brought out another point. They also indicated that they felt that there was considerable drinking by office workers, which could not be detected, but which probably does cut down their efficiency, although this probably could not be measured. All supervisors are reluctant to ask employees to do anything which they might hesitate to do, or might resent doing. Opinion generally seems to indicate that one important factor in drinking habits is the racial background, and that frequently the prevailing attitude is passed along from generation to generation. Racial groups or their descendants predominate in certain industries and in certain localities, giving rise to more noticeable localized practices in the use of alcoholic beverages. A survey to determine which those industries are, and a study to determine the importance of the problem, would entail considerable investigation. Descendants of Polish, Italian, German and other immigrants are all cases in point. Our conclusions, based on this rather incomplete evidence, but strengthened by its practical uniformity, are: (1) That this is not an opportune time for such a study in industrial and business concerns. (2) That such a study might well be undertaken after the war if labor conditions become more favorable. (3) That further expenditure of funds on even a preliminary survey is not justified by any indication of probable results. (4) That opportunities might be sought by the Bureau to circulate (where access can be had without union opposition) some form of personal-habit questionnaire, but that this ought not to be done as a study plant by plant, or industry by industry. (5) That clinics, like that in Newark, and particularly those started where specific racial groups predominate, might be used for getting suggestive material for later use. (6) That the project should not be permanently dropped, but that it should be kept for further consideration when conditions are less confused.

—From Report on Studies, 1939-1944, The Research Council on Problems of Alcohol.

Socialized Medicine

I REMEMBER so well, even though it was over 10 years ago, the day that two doctors called on me in offices in Paris and informed me that I was down for a hundred-dollar contribution. I was quite astonished and inquired as to the reason for such a large donation. "It's to fight socialized medicine," said one. "We must do all in our power to

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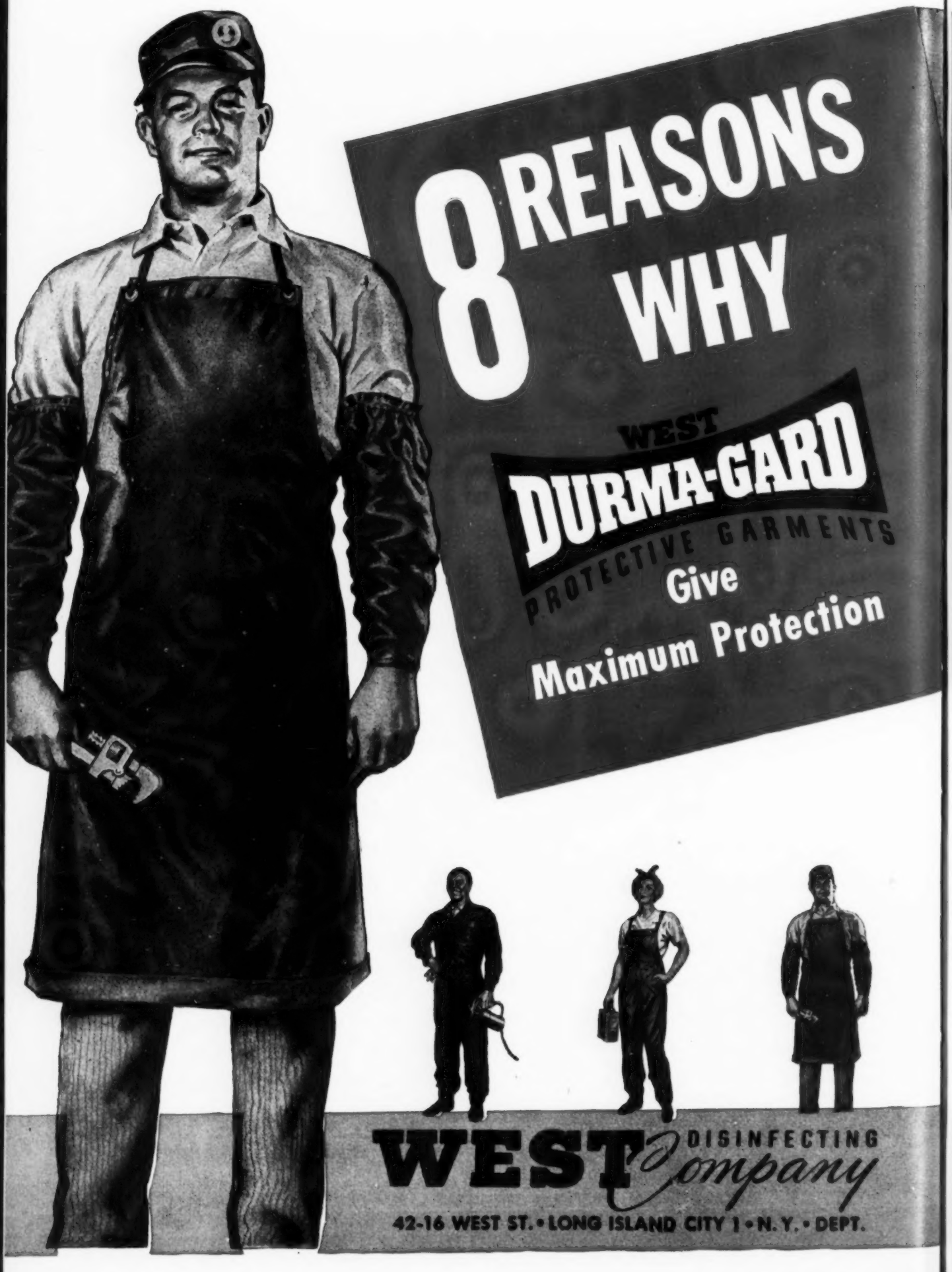
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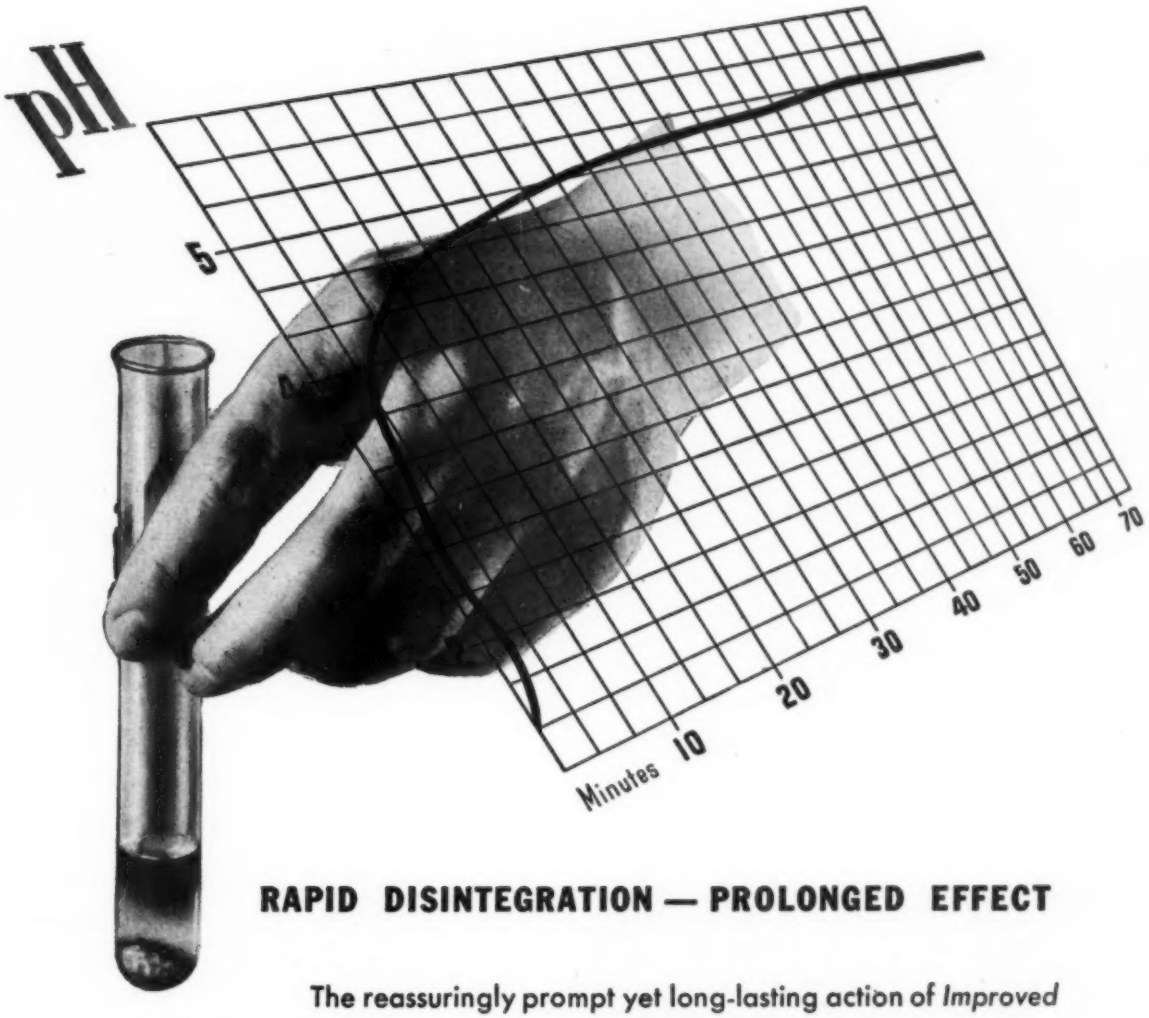
prevent regimentation," added the other. That was the first time I had heard of socialized medicine, but from that day to this I have been exceedingly interested in it and its development. Now the bill that was at first proposed in France was a most vicious bill, but no more so than the Wagner-Murray-Dingell bill that is before our Congress now. The medical professions were up in arms and fought as they had never fought before. They finally succeeded in defeating the bill, but then, instead of being ready to meet a situation that they could not dodge, they fell back after their first victory into a lethargic state; they sat back and rested, but, as they were resting, a new bill was presented, a bill which with terrific labor union backing was passed in spite of every effort the medical professions could make to stop it, and France had socialized medicine. Now this law that was passed was certainly not perfect. Surely the doctors could have drafted a much fairer and better law, but their entire efforts had been spent on fighting what others had proposed. They themselves had offered nothing constructive. In spite of the fact, which I am sure will surprise many of you, that this law was drawn up by the laity, it was not a bad law as a whole, and if the medical professions were called upon to vote today on whether to keep their present law or to abolish socialized medicine, the vote would be predominantly in favor of its retention. Their law had many faults, it is true, the principal one being—and this fault exists in the Wagner bill also—that the money collected did not go into a separate fund and its use was not restricted to the purposes for which it had been collected. The money collected was put into the general fund, and when time came to start paying old age pensions and other provisions, there was no money available, but only a book credit, and it became necessary for their legislature to appropriate additional funds and to increase taxation to cover their appropriations. There was in the French law a most important provision and that one is totally lacking in the Wagner bill. That was the care it assured the needy, the poor, and the indigent. Surely the one and only logical reason that can be advanced for socialized medicine is that by it, proper medical care is assured everyone regardless of his financial situation. However, in the law now before Congress, there is no provision for the care of those who need it most, but there is a most discriminatory provision whereby all government employees are taxed only half of what other employees must pay. The total tax collected in France for Social Security was 5% of salaries under $2,500, to be paid in equal parts, half by the employee and half by the employer. In spite of the fact that this rate is so much less than the rate proposed here, it was far more than was needed to cover all the costs of socialized medicine and to build up the planned reserve for old age pensions.

—From "Socialized Medicine in France," by JAMES M. SPARKS, M.D., *Texas State J. Med.*, July, 1945.

Doctors Under Nazism

SHORTLY after V-E Day, Colonel Edward D. Churchill, Allied Mediterranean forces' surgical consultant, toured six German military hospital areas and reported his findings to American correspondents. As we all know, American doctors' care of wounded in this war has been and continues phenomenal as regards its record-breaking percentages of cures and its development of new techniques and remedies. There was considerable expectation that the German doctors, with the German medicine's world-wide pre-Hitler fame and the well-known German thoroughness and energy, would have some pretty phenomenal achievements of their own to report from their war hospitals, once the Allies could crack into Fortress Europe and look around. The Allies cracked in, all right; but Colonel Churchill did not find the phenomenal German medical achievements. His over-all conclusion after in-



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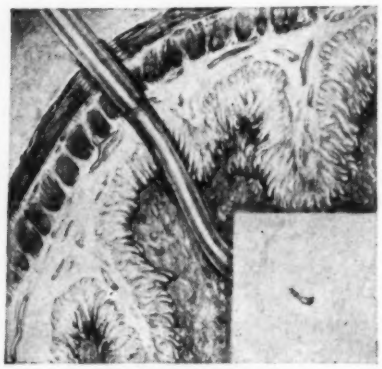

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specting six German hospital areas was that German handling of wounded was about 20 years behind the American procedure. Going into details, he reported that the German army doctors as a rule just casually passed up badly wounded men on the assumption that they were going to die anyway, whereas our doctors fight to the last gasp for every wounded man's life, and frequently win; that the German physicians never had realized the maximum possibilities of blood transfusion, and used antiquated apparatus for what transfusions they did give; that as for professional pride in pulling off near-miracles of cure or amelioration, such pride just was not in the bulk of German military physicians and surgeons. By and large, they were victims of an apathy and a lack of ambition which would enrage a typical American doctor. This is a sad backslide from Germany's once proud position as world leader in medicine and surgery. How did it happen? Are there any lessons in it for us? It began to happen soon after Hitler saddled his brand of totalitarianism on Germany. It seems reasonable to conclude that it happened because Hitler saddled Nazi totalitarianism on Germany.

—*Detroit Medical News*, August 6, quoting *Collier's*, August 4, 1945.

Lay View

Now I, as a prospective consumer of medical services, have a very definite opinion on this subject. There is nothing in my past contacts with government bureaucracies to make me enthusiastic about the idea. The relation of the doctor to his patient and to the patient's family is a highly personal one, and I cannot tolerate the idea of having any governmental red tape interposed between me and my physician. When it comes to calling a doctor, I am, and I propose to remain, the boss. I call the doctor of my choice —different doctors for different purposes, if I wish, or for different members of my family. If I am not satisfied with his handling of the case, or if he is too busy to come when I want him, I am free to call any other doctor. If I am convinced that he has been guilty of malpractice or neglect, I can even sue him. In short, I am the master who retains an expert—not a slave to a great, impersonal machine, out of my reach, and out of touch with my needs. Experiences of foreign countries, as reported to me, confirm my doubts on state medicine. In New Zealand, for example, a patient seized with illness at night cannot call a physician to his home, but must be taken to the hospital by ambulance. There he is examined, not by his own doctor, but by the resident who usually has no knowledge of the case history. If it turns out that the resident thinks the visit was unnecessary, the patient may be severely penalized.

—J. R. Van Pelt, Sc.D., Chicago, "The Patient Diagnoses the Doctor," in *Wisconsin Med. J.*, July, 1945.

Credentials

In forty years of my professional life, the medical profession has given the public, without monetary consideration, the benefit of every discovery and known remedy for relief of pain, prevention of disease, prolongation of life and reduction of the mortality rate. The members of the profession have spent years studying the ills of the human family, and, before they can enter upon the care of the sick, they are required by law to show credentials of their ability to render medical care. In my experience, I have found the profession sincerely using every possible effort to prevent disease and hasten the recovery of their patient. I have never known the medical profession to ask for a 40-hour week or to go on a strike, either in time of peace or war. Let me get to some realistic facts (free from flights of imagination). Dependable statistics recite in 1912, 16 deaths from diphtheria; 1943, one death. Diarrhea and enteritis under two years, 1912, 23 deaths; 1943, three deaths. A saving of 35 lives annually of potential citizens. Forty years ago it was conservatively estimated that (no death records at that date) there were 500 cases of typhoid fever, and 50 deaths annually; 1943, not a single death, a salvage of 50 persons yearly. Those recoveries had at least six weeks total disability making a total of 2700 weeks or 52 years of total disability annually in the county with 50 deaths. In 1912,

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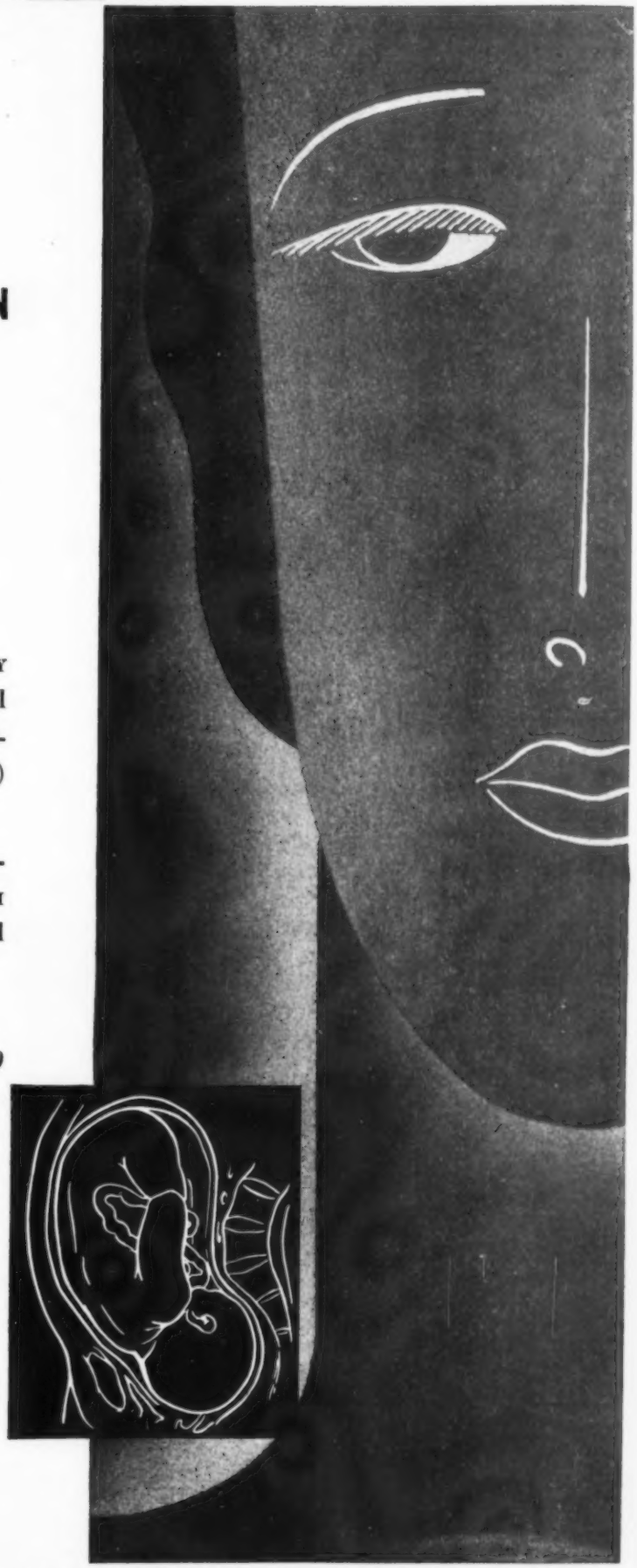

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there were 77 deaths from tuberculosis in Daviess County; 1943, 22 deaths, showing a saving of 55 lives annually. Each one of the tubercular victims experienced at least one year of total disability, making 55 years of disability gained yearly. I might go on further in my statements of the accomplishments of the profession in my locality. I am quite sure similar or greater results have been accomplished all over the U. S. With the above facts before me, I wonder who can show real (not imaginary) credentials so that they are as competent to direct the medical care of our nation as the present profession.

—From "Observations and Experiences of 40 Years in General Practice," by W. L. TYLER, M.D., in *Kentucky Med. J.*, August, 1945.

Manipulation

LET'S BRING out into daylight the flagrantly dishonest use of statistics by the social reformers in their manipulation of the total Selective Service rejections. With expressions of horror they have been telling the public about the vast number of men who could not meet the standards for induction into service, and have done it in a way that gives the lay person the impression that under a program of socialized medicine there would have been a minimum of rejections. How many men couldn't meet intelligence standards? How many hernias would socialized medicine have prevented? How many punctured ear drums? How would socialized medicine have changed the V.D. picture? How many men were rejected for congenital defects, and how would socialized medicine have forestalled that situation? How many men were rejected for ridiculously trivial defects? A 22 year old of my acquaintance, healthy and strong, was anxious to join the services, but was turned back because of a small, movable nodule near his spine—probably a bone chip. He had never known it existed.

—M.D., Pennsylvania, in *Medical Economics*, August, 1945.

Same Thing

MEMBERS of the minority who favor socialism in medicine would rear up, in many instances, at any suggestion of communism in medicine. Yet that's just what they're campaigning for. They overlook the fact that socialism has become a "respectable" weasel word among people who once used the now-discredited term, "communism." People fail to recall that (1) USSR means Union of Soviet Socialist Republics; (2) Nazi means national socialist (Hitler was an arch socialist); (3) Mussolini, Laval, Quisling, and virtually all the other fascists were socialists. Communism (alias socialism) is creeping up on us in this country through delegations of power to just such imported bureaucrats as Senator Robert F. Wagner. It was the promise of cradle-to-grave security that helped put Lenin, Stalin, Hitler, and Mussolini into power. The Senator knows a trump card when he sees one.

—*Medical Economics*, August, 1945.

Determined Doctor

DR. ELIZABETH O. HAYES, who had once worked at the Grenfell Mission in Labrador, where obstacles are mere incentives to accomplishment, recently resigned as physician for a Pennsylvania mining company because it would not do what she thought necessary for the health of employees. She demanded sewers, water system, inside bathrooms and foundations under houses. The state health department told her the conditions were no worse than in other mining towns thereabouts. The attorney for the miners thinks the rest of the state must then be in a bad way, because sewage flows from outhouses into streets where children play, and into wells of drinking water, five of which were found contaminated. The general manager of the mining company says the doctor demands "economic impossibility." It's hard to get bathroom materials, he says, and financially impossible to lay over three miles of pipe for a town of 94 houses. He adds: "DR. HAYES has the people worked up to a white heat. She organized them like the 13 colonies and they're now ready to stage another Boston Tea Party." The physician thinks an epidemic would cost more than pipeline and inside plumbing. "Why wait for an epidemic to do something?" she asks. Similar problems occur elsewhere Too often the epidemic gets there first.

—*Pensacola, Florida, News*, August 8, 1945.

Sanitary Coal Mining

NOW that we have about all the liberty we can use in this country, there has arisen a corresponding demand for sanitation. It may be a little late in its arrival, but in hundreds of communities is making up for lost time. A typical example is the small mining town of Forace,

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Pennsylvania. The crusading spirit, as usual in recent cases of this kind, is a woman. Adding effectiveness to the hygienic enterprise is the fact that she is a doctor. And a doctor not of divinity, but of medicine, which ranks cleanliness next to godliness. Her name is DR. ELIZABETH O. HAYES, age 33, a former worker at the famous Grenfell Mission in Labrador. She has declared that she will resign as physician of the local mining company unless the company makes health improvements in the company-owned houses. If the company refused, and Dr. Hayes' threat were carried out, apparently it would leave the whole mining area without medical care. But the insistent doctor may get what she wants.

—*Two Rivers, Wisconsin, Reporter*, August 6, 1945.

Where Have You Been?

VETERANS returning to the job from foreign service may carry strange, dormant diseases. The Inland Steel Co., of Indiana Harbor, Indiana, is showing how to find, diagnose, and treat them through industrial medicine. Inland's system was devised by its medical director, DR. E. H. CARLETON. Months ago he began to dig into dusty textbooks and current medical literature, especially the reports of Army and Navy doctors. He divided the world into 329 areas and listed the uncommon maladies to which servicemen have been exposed in each. Then he compiled an alphabetical list of the diseases and summarized their symptoms, cause, nature, and effect. Now, when a veteran applies for a job, a doctor or medical interviewer makes a record of all the places he has visited, the illnesses he has suffered, and the changes in health he has noticed during and after his military service. Should he suddenly become ill at work many months later, the Inland doctor, to make a preliminary diagnosis, need only refer to the veteran's medical record, the CARLETON geographical index, and the CARLETON report on possible diseases. Of 141 veterans examined for employment in a recent six month period, seven were found to have history or evidence of tropical disease. Through CARLETON'S records, Inland was able to suggest suitable jobs and recommend treatment if needed. DR. CARLETON graduated from the medical school of the University of Kentucky in 1932 and began practice with an orthopedic surgeon in Louisville. Later he went into practice for himself, but money was scarce because of the depression. The flood of 1937 ruined his office and he gave up. A few months later he joined Inland at its Wheelwright coal mine, in the mountains of Eastern Kentucky. Inland had bought the mine in 1930 and set about transforming the town from a stinking mess to a pleasant, proud community. CARLETON helped. The company piped the town for water and built a reservoir in a worked-out mine. A modern sewage system doomed a forest of time-honored outhouses; an incinerator replaced "Garbage Hollow." Wheelwright grew strong. DR. CARLETON became assistant medical director of Inland in 1940, and director last year when his predecessor, DR. A. G. KAMMER, entered government service. Now 41 and graying at the temples, CARLETON watches over 11,000 employees. The staff of Inland's clinic at Indiana Harbor includes three doctors and 16 nurses and technicians. CARLETON thinks many businessmen have failed to recognize the value of industrial medicine and to hold out enough inducement to young doctors. Before long, he predicts, the field will offer better money and medical schools will offer more specialized training. And young doctors will respond.

—*Newsweek*, August 13, 1945.

Industrial Medical Practice

ABOUT one-fourth, or 4,215, of the medical officers answering a recent questionnaire indicated that they wished to enter the field of industrial medicine when they returned to postwar civilian practice, LIEUT. COL. HAROLD C. LEUTH, Medical Corps, AUS, reports in the May 12 issue of *The Journal of the American Medical Association*. The questionnaire was prepared by the Committee on postwar Medical Service of the AMA to determine the future

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desires of medical officers. It was distributed to each medical officer on active duty with the Army, Navy, Public Health Service and Veterans Administration. Of the 4,215 doctors who were interested in industrial practice of medicine, there were 863 who wanted full-time positions and 3,352 who wanted part-time positions. There were 484, or 56%, who wanted special training in the field, and 379, or 44%, who did not want special training. The greatest number of requests for special training came from the youngest graduates. Interest in the practice of industrial medicine has been constantly growing among the medical profession and for purposes of future planning, COLONEL LUETH points out, it is desirable to have an estimate of the likely status of industrial health in the future. An analysis of the figures shows that about four times as many men wanted part-time positions in industrial medicine as wanted full-time positions. Special courses in industrial health were requested by a total of 1,809 medical officers. They included men who desired full-time positions in industrial medicine, men who desired part-time positions in industrial medicine and men who were undecided about future positions in industrial medicine.

—*Illinois Medical Journal*, July, 1945.

Heavy Gun

DEAR DOCTOR LIGHTBODY (Editor): Attached will be found a photostatic copy of a letter received at my office in one of the local defense plants. It is the type of letter we expect to receive from chiropractors, healers and certain osteopaths, but is sent by a reputable downtown surgeon. The employee in question is a plant guard who had an uncomplicated appendectomy over a year ago. The "heavy gun" he is expected to carry weighs less than four pounds including the holster and belt. Considering the location of its origin in the David Whitney Building, it is quite probable that this is a "five dollar big brother" to the usual "two dollar note," which Doctor Harm referred to at the last State Industrial Health meeting at the Rackham Building. Is it any wonder that the plant physicians are unable to grant all of the requests of the private practicing physicians, and also sometimes begin to lose faith a little in their fellow men? E.E.W., M.D. (Copy of photostat letter referred to in above statement: "To Whom It May Concern: This is to certify that not long ago Mr. P..... O.....underwent a serious abdominal operation and I feel that carrying a heavy gun against his side is detrimental to his health. (Signed).....M.D."

—*Detroit Medical News*, August 27, 1945.

Industrial Dentistry Expands

INDUSTRIAL dentistry, which gained attention in the production crisis of World War I, once more has become a recommended industrial health service in World War II. The earlier dental programs, many of which are still operating, were designed to render complete dental service for the employee. The present day concept of industrial dental service is patterned after industrial medicine and limits operations to oral examinations and diagnosis, emergency treatment, and dental health education. Referral of the employee to outside dental offices for complete dental care is included. Recently two industrial plants, Carnegie-Illinois Steel Company, of Chicago, and American Tool and Die Company, of Reading, Pennsylvania, established industrial dental programs which provide this type of dental health services for all employees. The chemical plant of the TVA at Wilson Dam, Alabama, has enlarged its dental unit to provide these services for all plant employees. Some of the older industrial dental programs which have been supplying all types of dental service for the plants' employees are considering changes which would furnish limited service for a greater number of individuals. Industrial dentistry is now being taught in dental and public health schools. The DeLamar Institute of Public Health at Columbia University in December, 1944, conducted a five-day course in industrial hygiene and industrial dentistry and expects to repeat these lectures in 1945. Thomas W. Evans Museum and Dental Institute, University of Pennsylvania, is now giving lectures in industrial dentistry to the junior and senior classes. It is planned that these lectures later will be integrated in the instruction through the four-year curriculum. The work of Drs. I. Schour and Sarnat of the University of Illinois

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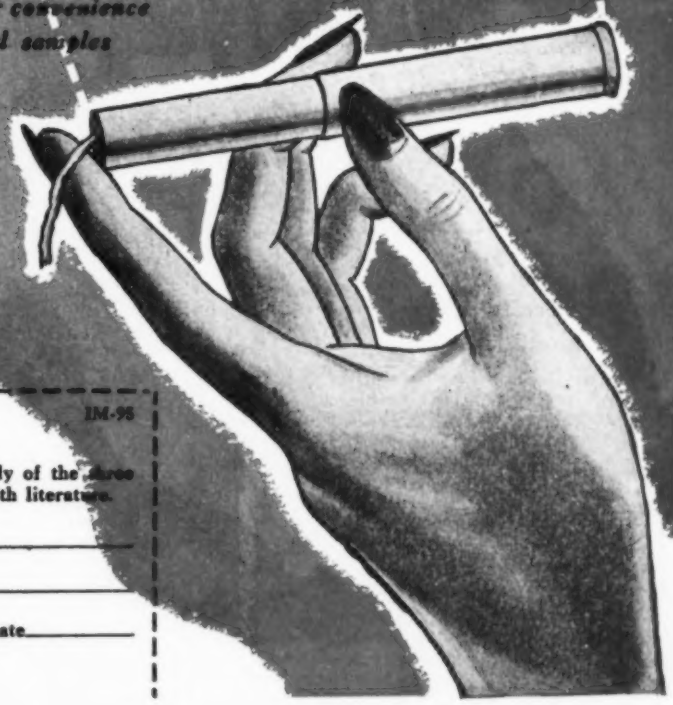

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School of Dentistry on oral manifestations of occupational disease is well known, and lectures on industrial dentistry are being given in classes of this dental school. State dental associations through their Councils on Dental Health and Committees on Industrial Health are conducting industrial dental surveys within the states and are canvassing their membership for dentists who are interested in industrial positions. Serious thought is also being given to the limitations that some of the state dental practice acts place on the practice of dentistry. Although these "acts" did not intend to ban dental programs in industry, the wording of the legislation in many instances forbids the employment of a dentist by an industrial plant. Medicine has not been so shortsighted and industrial medicine is approved or at least not banned by state medical practice acts. Dentistry should not allow a condition to exist which withholds dental health from large groups of people. The industrial workers comprise almost one-half of the total population of the United States and include a large percentage of persons who do not seek dental care for themselves or their families. Considering this, it is apparent that industrial dentistry and dental health education will make dental services available to a large segment of the population hitherto not reached. It will aid in reaching the objective, so long advocated by dentistry.

—*Dental Health*, August, 1945.

CURRENT ARTICLES of QUALITY

Air-Borne Infection

STUART MUDD, M.D., Department of Bacteriology, School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania, "Airborne Infection—The Rationale and Means of Disinfection of Air," *Bulletin of the New York Academy of Medicine*, August, 1945. Summary: "Respiratory disease is responsible for more than a third of the total number of person-days lost to American industry by disability; it is of course a correspondingly serious problem in domestic life and during military training. The air of enclosed spaces is at present the principal vehicle for the dissemination of respiratory disease. The rationale of rendering air safe for human occupancy has been laid down in the laboratory and in suitable, controlled human environments. The means are ultra-violet irradiation, dust-suppressive measures, and the use of germicidal vapors of hypochlorous acid and of propylene and triethylene glycol. Elaboration of the practical art of providing safe air supplies is, however, not to be accomplished cheaply or through the efforts of a few people. A specialty or specialties in sanitary engineering will have to develop around air sanitation, as has occurred around water and milk sanitation. Physicians, air-conditioning specialists, heating, ventilating, and illuminating engineers, architects, the manufacturers of necessary equipment, agencies regulating public health practice, and the industries which will benefit by reduction of industrial disability through respiratory disease ultimately will all have to contribute effort and money to solving the manifold aspects of the problem. How much is it worth in wartime to reduce an annual industrial waste equivalent to the output for a year of approximately a half million workers? How much is it worth in peacetime to reduce a corresponding loss of efficiency and well being from the drain of respiratory infection?"

Mass Health Surveys

THIS statement has been prepared by the Council on Industrial Health and approved for publication —C. M. PETERSON, M.D., Secretary. (*Journal of the American Medical Association*, 128:15, 1099, August 11, 1945): "An important component of industrial health examinations is the discovery of non-occupational disease, often in incipient and readily manageable stages. Early detection of illness and prompt adequate treatment are in the best interests of the worker, the employer, the community and the medical profession. Increasingly in recent years official and voluntary health agencies have regarded industry as a convenient avenue for special case-finding campaigns—especially tuberculosis, syphilis and defective vision. All have important relations to the general public health

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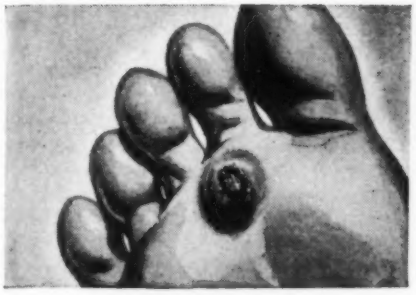
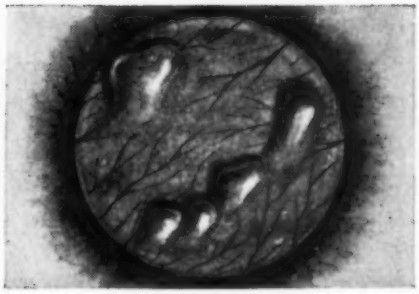


Indolent Ulcers

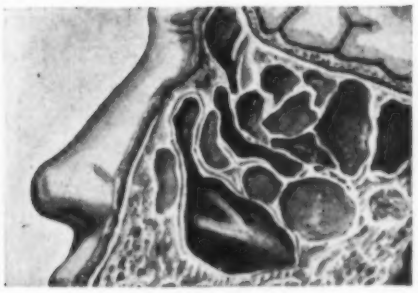
Abscesses

Pleural Cavity

Infected Wounds



Urinary Bladder



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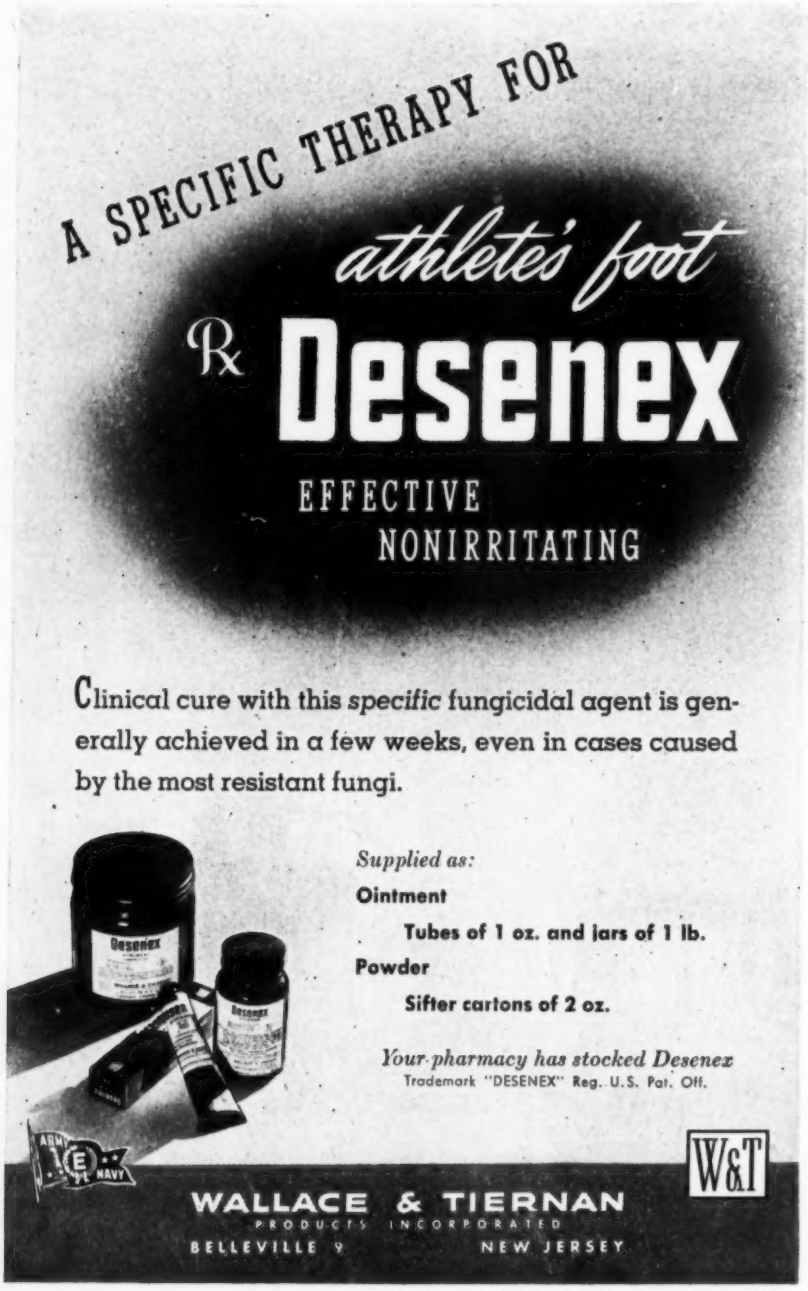
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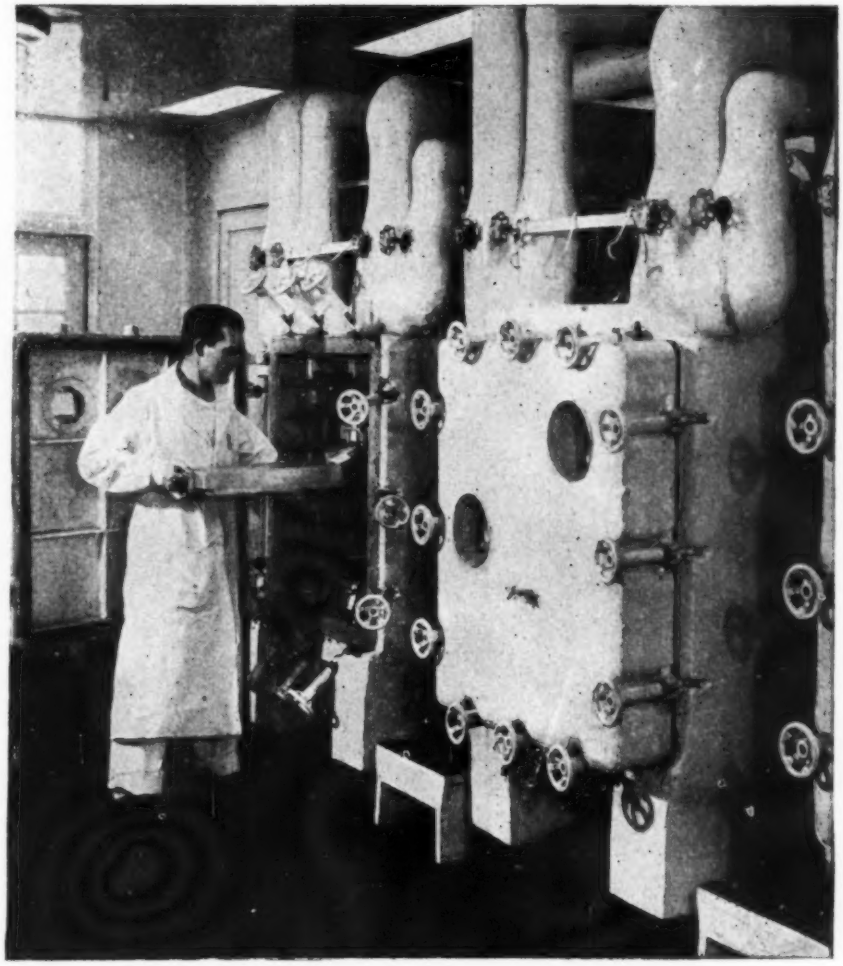
or are designed to improve production and earning power or to reduce troublesome absenteeism and wastage. The Council on Industrial Health believes that these case-finding campaigns conducted in industry by outside agencies merit support and cooperation from the medical profession provided certain general principles are observed: (1) The local medical profession, health authorities and other affected community health facilities should be fully advised well in advance about the purposes and scope of the survey. (2) The personnel undertaking the survey must be professionally competent and employ acceptable equipment and procedure. Results of examinations should be interpreted by physicians of experience and training in the methods employed. (3) Mass health surveys are essentially screening operations. Unless preliminary agreement suggests otherwise, the details of confirmatory diagnosis should be regarded as responsibilities of the established medical, clinic, or laboratory facilities in the community. (4) Full consideration needs to be given to the disposition of individuals with clinically significant findings. They should be promptly referred to personal physicians or other authorized community agency for additional study and individualized treatment. (5) Means for isolation, hospitalization or other essential treatment need careful evaluation in advance of the survey. (6) Reporting and epidemiologic investigation of communicable disease should conform with the regulations of the health department having jurisdiction. (7) Surveys should be conducted only after the plant medical service has had an opportunity to study the proposed activity and given its approval. The details of case finding should conform to accepted industrial health procedure and be integrated with the regular activities of the plant medical department. The industrial physician should be consulted particularly (a) on discovery of coincidental disease or disability having suspected occupational etiology, (b) regarding plans for referral of patients and follow-up, and (c) about the details of re-employment, especially placement in suitable occupations of individuals with residual impairment."

Tuberculosis Control

HERMAN E. HILLEBOE, M.D., F.C.C.P., Medical Director, Tuberculosis Control Division, USPHS, and DAVID M. GOULD, M.D., Surgeon (R), Tuberculosis Control Division, USPHS, "Tuberculosis Control in Industry," in *Diseases of the Chest* (11:3, 278-281) May-June, 1945. Text: "Tuberculosis is not considered an industrial disease, although in certain dusty trades involving the inhalation of particles of silica there may be a relationship between pulmonary tuberculosis and occupation. Despite the non-occupational character of pulmonary tuberculosis in general, the peculiar conditions of modern industry have tended to expose workers to more massive and repetitive concentrations of tubercle bacilli than other segments of the population. Unfavorable social and economic factors such as crowding, at home and in the workshops, and low income are clearly reflected in the tuberculosis mortality data. Every study of urban housing has shown that tuberculosis death rates in the crowded areas of cities are many times greater than the rates in the less crowded areas; and that industrial workers and their families are concentrated in these areas. The death rate of tuberculosis (all forms) for males is higher among residents of large cities than among residents of cities of intermediate size. The rate in smaller cities in turn is much higher than that in rural areas. Dublin, in an analysis of Metropolitan Life Insurance records, finds that between the ages of 35 and 44, death rates from pulmonary tuberculosis in industrial male policyholders is about 2¼ times that of non-industrial policyholders. Propagation of the tubercle bacillus finds a fertile soil in cities, where many people live and work in close quarters and even breathe each day a certain number of cubic feet of air shared with other persons. It may well be that the dosage of bacilli plays an important role in the production of clinical tuberculosis; on this basis alone one may expect to find greater opportunities of infection among the people in densely populated areas. Industrial buildings such as the Ford Bomber Plant at Willow Run and office buildings such as the Pentagon in Washington, are good examples of modern industry's tendency to concentrate over larger groups of human beings in limited spaces in the pursuit of wage earning. It should also be remembered that approximately one-



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third of the average adult's life is spent in the task of earning a living. A lower standard of living appears to be intimately associated with lowered resistance—the second factor in the production of tuberculosis. In a study of tuberculosis mortality among industrial workers by Rollo H. Britten,[1] it was found that the rate among unskilled workers, ages 25 to 44, was four times as high as among professional, business, and clerical workers of the same age group. High concentrations of tubercle bacilli in the environment and lowered resistance of the individual can be altered by known methods, such as improvements in community and industrial environments and raising the standard of living. At the present stage of scientific development, there is no practical application of altering the virulence of the tubercle bacilli. However, general improvements in the social and economic status of the country will not, of themselves, reduce or control the spread of tuberculosis in the industrial population. The first task of the physician, whether a general practitioner, a specialist in chest diseases, an industrial physician or a public health officer, is to seek out the human reservoirs of the tuberculous and render them non-infectious. Fortunately, the industrial environment which favors the spread of tuberculosis also enables the physician to use modern methods in attacking the disease, controlling it, and ultimately eradicating it. The large groups of men and women working under one roof and in the disciplined environment of a modern plant form an ideal medium for mass x-ray surveys for tuberculosis case-finding. It is known that tuberculosis strikes most frequently among productive workers in the community—men and women between the ages of 20 and 45. Nearly one-half (47%) of all deaths from tuberculosis in this country during the period from 1939 to 1941 occurred in this age group. From early adulthood to age 35, tuberculosis is the leading cause of death. At ages 20 to 34 one in every six deaths among white, and one in every three deaths among non-white persons is due to tuberculosis. With these facts in mind, the USPHS in 1942 turned to the recently developed photofluorograph x-ray machine for a mass approach to the industrial populations. From May, 1942, to April, 1944, over 700,000 individuals had chest x-ray examinations including 576,828 industrial workers. Field units have operated in 17 States, the District of Columbia and Mexico City. Over 200 plants were surveyed. High priorities for surveys were given to Government owned and operated plants, shipyards, air depots, and ports of embarkation. Analysis of 418,608 reports reveals 6,197 persons or 1.5% with evidence of reinfection tuberculosis. Of these 3,970 or 64.1% were in the minimal stage; 1,817 or 29.3% were in the moderately advanced stage; and 410 or 6.6% were in the far advanced stage. It is estimated four in every five positive cases were not known to either private physicians or to official and non-official agencies. Indeed, the majority of patients themselves were completely unaware of a chest disease. The significance of these findings cannot be emphasized too strongly. Almost two-thirds of the cases are now being brought to light in an early and remediable stage in contrast to the pre-war situation in which only one out of 10 patients came to the physician for treatment in the minimal stage. Certainly the implications in these figures are vast. To deal effectively with the increased and changed composition of the current case-load in large industrial communities the present concept of follow-up and treatment must be revised drastically. Although the 35 mm. film is considered an effective screen, in Public Health Service surveys, each person with x-ray evidence of disease on a small film obtains a conventional 14 in. x 17 in. film to corroborate the findings and to furnish more detailed information as to the nature of the lesion. It is not good practice to report a person with roentgenologic evidence of tuberculosis, as a case of pulmonary tuberculosis to health authorities, on the basis of the x-ray diagnosis alone. Adequate clinical workup including history, physical, laboratory tests, and several roentgenograms is a pre-requisite before a case can be said to have been found. Injustice is done both to the interpreter of the x-ray film and the patient when clinical confirmation of the radiologic presumption is not obtained. As a valuable by-product of the mass x-ray technique which was designed primarily for tuberculosis case finding,

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many cases of non-tuberculous pulmonary pathology have been discovered among industrial workers. Numerous persons with cardiovascular disease, pneumoconiosis, bronchiectasis, tumors, and rare, even bizarre conditions, have been brought to light. An analysis of 422,252 films in USPHS surveys revealed that 4,992 or 1.1%, showed evidence of non-tuberculous chest pathology; 66 different categories of chest lesions were observed. Because of the large numbers of people in industry the USPHS chose the small film photofluorograph as an efficient and cheap means of screening apparently healthy people into two groups: those with x-ray evidence of chest disease and those with essentially normal chests. The automatic camera is capable of taking 700 chest x-rays in one loading and the ease of processing the films is a decided advantage. Considerably over 100 persons can be x-rayed each hour at a total over-all of approximately 15 cents per film. In addition, 200 to 300 films can be interpreted per hour without undue strain to the reader. Over three quarters of a million films are stored in a small cabinet file 5 feet high, 3 feet wide and 1½ feet deep. Under certain conditions, 4 x 5 inch films, 14 x 17 inch films, paper films, and fluoroscopy all have their advantages. Controversy as to which is best is futile. The purpose of the program, the extent of the problem, and the availability of personnel and funds must be taken into consideration. The chest specialist can render a great service to industry and the management of both the tuberculous worker and the worker with non-tuberculous chest disease. He is ideally fitted to give clinical diagnosis, treatment and follow-up for the large numbers of persons disclosed to have lesions. Many industrial physicians lack the time and specialized training for ready handling of workers with chest abnormalities. Both the chest physician and the industrial physician would have much to gain if an organized cooperative plan could be worked out. In certain large industries where such plans exist, results have been eminently satisfactory to all concerned—the employer, the worker, the industrial physician, the radiologist and the specialist in chest diseases. It is generally agreed that a worker with communicable tuberculosis must be given an employment furlough until he is rendered non-infectious to his fellow worker and to the community at large. The labor unions have recognized this principle, both for the protection of their members and of society. It is also apparent that the tuberculous worker employed in the dusty trades must be given special protection from the deleterious effects of silica dust. Employment in a dust-free atmosphere is essential. The difficulty arises with the inactive case and the active case which is regressive. Some employers and even some industrial physicians take the attitude that any worker with tuberculosis should be discharged. Such wholesale termination of employment, is not only unfair but shows a lack of understanding as to the nature of tuberculosis. A great deal of education is necessary to demonstrate that workers with inactive pulmonary tuberculosis may be employed safely, if they are properly placed and given medical supervision. Today, under the stress of war and depleted manpower, many industries have gone to the other extreme of employing tuberculous men and women who for their own sakes as well as that of their fellow workers should not be employed. Here too education of management, labor, and the public is an essential phase of tuberculosis control in industry. If modern control methods are to function fully for the benefit of industry, labor and the health of the nation, fair and liberal employment policies must be worked out between management and labor, before mass chest x-ray surveys, pre-placement chest x-rays, and periodic x-ray examinations are undertaken. Mass application of the photofluorographic technique opens an unparalleled opportunity to control tuberculosis among the 50,000,000 workers and their families of the United States. The x-ray points out the infected pool; the follow-up and treatment must be geared to keep in step with the newer methods of case-finding. Just as the tubercle bacillus has been practically eliminated from cattle, it now lies within the realm of possibility to eliminate the tubercle bacillus from human society."

1. BRITTEN, ROLLO H.: "Mortality Rates by Occupational Class in the United States," Reprint 1648 from Public Health Reports, 49:9, September 21, 1934.

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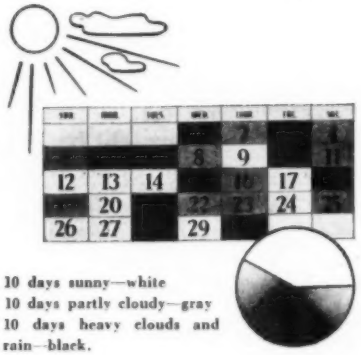

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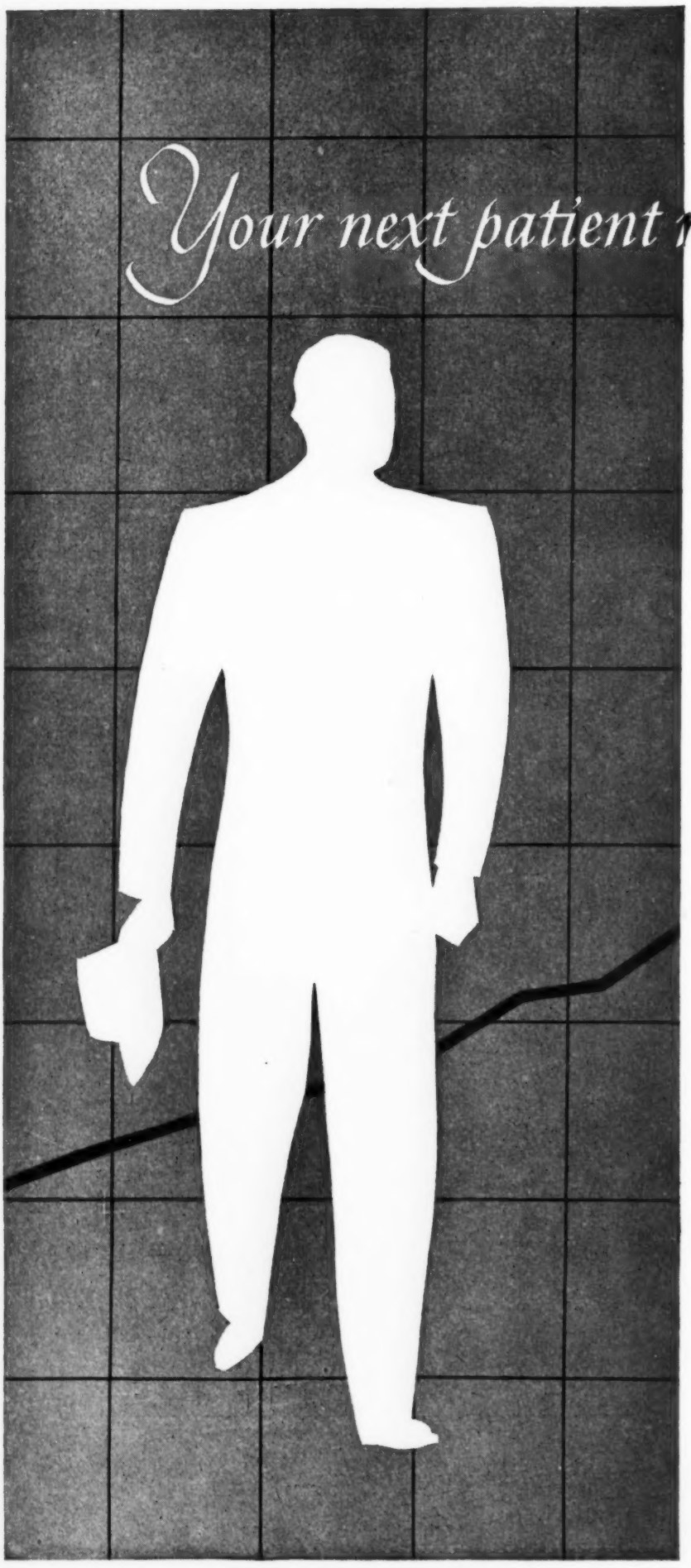

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A REVIEW of the records of over 45,000 selectees by Blotner and Hyde* reveals an incidence of diabetes among young adults much greater than earlier studies have indicated. In the eighteen to twenty-five-year age group, the number of cases was found to be three to four times as high as shown in the National Health Survey. In men of twenty-five to forty-five years, diabetes occurred four to five times as often as in the previous estimate. Another striking fact—78 percent of the cases thus discovered were not aware of ever having had diabetes!

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*Blotner, H., and Hyde, R. W.: New England J. Med., 229:885, 1943.

This magazine is published to promote sound thought upon and concerning industrial medicine and traumatic surgery. To that end it will contain articles, news items, reports, digests, and other presentations, together with editors' comments. The editorial policy is to encourage frank discussion. On this basis contributions are invited.

Industrial Medicine

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The Journal of Industrial Health, Occupational Medicine and Traumatic Surgery

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The Science, the Law and the Economics of Industrial Health

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Tuberculosis Prevention in Industry

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DISEASE prevention has become one of the important functions of industrial medicine. In the course of pre-employment examinations such diseases as syphilis and tuberculosis, for instance, can readily be detected if the examining physician directs his attention to their diagnosis.

Tuberculosis Case Finding

THE Medical Department of the Caterpillar Tractor Company has had an x-ray laboratory from its inception, and chest radiograms have been taken routinely since the fall of 1936 of all applicants and employees before they were assigned to jobs entailing the hazard of silicosis. Others were x-rayed occasionally. To facilitate the discovery of tuberculosis in an economical way, in 1943 a stereoscopic photofluorographic unit (4 x 10) was added to the laboratory. It was planned at this time to take a chest radiogram of every applicant for a job. Because of the large number of applicants and turnover in personnel, however, this plan had soon to be abandoned, and the use of routine radiograms had to be restricted by necessity.

Today chest radiograms are taken routinely, (1) before assignments are made to jobs entailing silicosis hazards; (2) of all colored applicants; (3) of applicants whose past history is suggestive of tuberculosis; (4) of applicants whose physical examination shows symptoms referable to tuberculosis; and (5) all employees who are absent, because of illness, for more than seven days have to undergo a medical examination before they are permitted to work again. In these instances a chest radiogram is taken whenever the worker has had an upper respiratory infection, or a lung ailment.

The 4 x 10 stereoscopic radiogram is used in the routine examinations. Whenever these films show abnormalities, a 14 x 17 flat film is taken for confirmation. The large films showing any deviation from the normal are submitted for study either to the Medical Director of the Peoria Municipal Tuberculosis Sanitarium or of the Peoria County Tuberculosis Sanatorium District, depending on the residence of the employee in question. Should such study discover any signs of tuberculosis the employee is referred to the tuberculosis agencies of their respective residence, for further examination and final diagnosis. We have found this arrangement mutually beneficial to the employee, the management of the Company and the respective public health agencies.

Since the installation of the photofluorographic unit on October 30, 1943, till July 27, 1944, when the tuberculosis survey reported on subsequently was completed, 4,724 chest radiograms have been taken.

Of the 4,726 people examined, 351, or 7.4%, were office workers and the remainder skilled and unskilled laborers; 2,832, or 59.9%, were males. In 88, or 1.8%, of the total examined the chest radiogram disclosed changes indicative of pulmonary tuberculosis.

In these 88 cases the lesion was of minimal extent in 63, or 71.6%; moderately advanced in four, or 4.5%; far advanced in three, or 3.4%; 12, or 13.6%, had healed hematogenous tuberculosis; one, or 1.1%, each had silico-tuberculosis, pleural effusion, calcification of the pleura and extensive healed primary lesion respectively. The number of active cases totaled 14 (eight minimal, four moderately and two far advanced), or 0.29% of the 4,726 people examined.

During the period of October 30, 1943, till July 27, 1944, five cases of tuberculosis discovered by the family physicians and 15 selectees rejected because of tuberculosis among the workers of the plant and residing in the City of Peoria were referred to the Chest Clinic of the Peoria Municipal Tuberculosis Sanitarium.

Of these 20 cases, three, or 15%, were minimal active; seven, or 35%, minimal arrested; one, or 5%, moderately advanced arrested; four or 20%, far advanced active and five, or 25%, had healed hematogenous tuberculosis.

The subsequent survey, reported upon presently, has shown that only 46% of the factory employees have resided in the City of Peoria. Hence, it is reasonable to assume that an additional 20 cases were discovered in the remainder of the group who resided outside of the City.

Survey of Caterpillar Employees

IN OCTOBER, 1943, E. E. STEINKOPFF, M.D., Chief, Division of Tuberculosis Control, informed us that the State Department of Health is making available to communities a 35 mm. mobile photofluorographic unit for industrial tuberculosis surveys, under the following conditions: (1) An application for the use of the unit will be made by a responsible health organization. (2) The approval of the survey by the County Medical Society will be obtained. (3) Arrangements will be made locally for preliminary educational work in the plants to be surveyed. (4) The services of a competent physician will be provided locally to study the films. (5) The miniature films will be used for screening purposes only and no diagnosis will be made from them. (6) The necessary clerical help will be provided locally.

The unit consisted of a 35 mm. photofluorographic equipment transported dismounted on a panel truck, an x-ray technician and her assistant for positioning the patient. The State Health Department also furnished the films and chemicals needed.

It was an easy matter to provide the necessary local organization, because for years Peoria has organized its Coordinating Committee on Tuberculosis Control. On this Committee are represented the Peoria Municipal Tuberculosis Sanitarium, Peoria County Tuberculosis Sanatorium District (charged with the control of tuberculosis in that portion of Peoria County which lies outside of the City limits), Peoria County Tuberculosis Association, the Health Department and the County Medical Society. It is the function of this Committee to coordinate all tuberculosis control activities in the City and County of Peoria.

The approval of the Medical Society was readily obtained by the Committee. The Tuberculosis Association furnished the necessary clerical help, records, and mailing costs, and later provided the services of an Educational Director. The Medical Directors of the Municipal Sanitarium and of the County Sanatorium District volunteered their services to read the films after their regular working hours.

In 1943 Metropolitan Peoria had an industrial population estimated at over 34,000 workers engaged in war production in plants employing from a handful of people to around 17,000. The industrial area, however, spreads into Tazewell County where the largest industry, the Caterpillar Tractor Company, and other large plants are located. While apprehension was voiced in some quarters that Peoria organizations should undertake a survey beyond the limits of the County, it was realized that such considerations would militate against an effective survey of Peoria residents. The decision to extend the work outside Peoria was made the easier because the representatives of the local public agencies did their work on their own free time.

In selecting the first plant for the survey the choice fell on the Caterpillar Tractor Company which maintains an excellent Medical Department, is recognized as a leader in employee welfare activities, and enjoys an uncontested prestige among management and labor alike. It was felt that once the cooperation of this organization had been obtained, the other plants would readily follow the example set.

The management recognized the value of the survey and readily granted permission for it. The plan then was presented jointly by the representatives of the management and of the Coordinating Committee to the representatives of the factory employees who pledged their wholehearted cooperation. It was agreed that the results of the examinations would be held strictly confidential, as medical examinations should be, and only the employee and his family physician would be notified of the results. No report was to be given either to management or to the Medical Department. Management wanted it strictly understood that its only part in the survey would be to give permission for having the survey conducted on company time because it desired to cooperate in improving the health of its employees.

Careful consideration has been given to the selection of educational activities. Because of the large number involved it was impossible to give lectures before the employees. The use of posters was frowned upon by the management, because in its experience little attention is being paid by the employees to the bulletin boards completely covered by various announcements and posters. Because the supervisors and foremen occupy a key position in transferring information to the employees, it was decided that management send a special letter to every foreman and supervisor explaining to him the purpose of the examination and requesting his cooperation in the undertaking.

A special insert was prepared for *News and Views*, the popular house organ of the company which is faithfully read by every employee, for its issue published just before the survey was started. In this insert were published the letter of the president of the Sanitarium Board requesting the company to permit the conducting of the survey and an article explaining the survey, stressing the fact that the results of the examination would be divulged only to the respective employee and his family physician. The insert was well illustrated with poster mats and the picture of an x-ray unit in operation. Patients of the Municipal Sanitarium, who were employees of the company, have written letters to their fellow workers calling their attention to the importance and great value of the survey.

The unit was in operation from April 17 to July 27, 1944. During this time it was set up in seven different strategic locations in the plant and brought as close to the groups examined as was deemed practical. The company assigned two of its safety engineers to the day shift and two to the combined second and third shift examinations to direct the employees to and from the unit. The services of these engineers proved to be invaluable, because it was due chiefly to their efforts that such a large number of employees participated. The Time Keeping Department made repeated spot time studies of the time spent by the employees from the bench to the unit and back, and found that on the average about 10 minutes were spent in the whole procedure, or not more than for a walk to the rest room.

Because in every plant the key person, who has the most to say about the interruption of production, such as a tuberculosis survey represents, is the production manager, we believe it is pertinent to quote here from a letter directed to one of us by MR. JAMES R. MUNRO, General Factory Manager: "I did visit the x-ray unit one of the first days it was operating and was quite impressed with the organization set up. As you probably know, this program has been well received and is both functioning and progressing well."

We may add here that we made ample use of this letter subsequently when arranging for the survey in other plants, and that it helped us greatly in securing the cooperation of their managements.

Prior to and during the survey, articles dealing with it were published repeatedly in the house organ *News and Views*, in the daily press, in the papers of the local unions, and the various phases of the work were discussed in the *Peoria Fluoroscope*, the publication of the Municipal Sanitarium, which has a fair-sized mailing list.

At the time the survey began the company had 16,963 regular employees on its "hourly" and "weekly" payroll. By the end of the survey 13,547, or close to 80%, of these had been examined. This percentage is obviously not accurate, because in the course of over three months while the survey was conducted, there was a considerable turnover among the employees. On the other hand it must be taken into account that, as stated above, an additional number of 4,726 employees were x-rayed in the Medical Department in the five months prior to and the three concurrent with the survey. A certain number of employees, too, have been under the supervision of tuberculosis agencies, because they were either former sanatorium patients, or contacts of tuberculosis patients. It is reasonable to assume, therefore, that a significant number of employees who did not participate in the survey, were prompted to such attitude, because they had had a chest radiogram shortly before the survey, or were under observation by the various agencies. Under these conditions the percentage of participation must be considered entirely satisfactory.

The radiograms taken by the unit were read alternately by two of us (M.P. and R.H.R.) and of cases with abnormalities a 14 x 17 film was taken by the unit and the radiological diagnosis was made on the standard films. Reports of these findings were made immediately to the family physicians of those individuals who resided in the City of Peoria and in Peoria County with the request that the patients be sent for examination to the City or County Clinic respectively of which the above two of us have charge. In the case of those who resided outside of Peoria County the report was sent to the family physician and to the tuberculosis control agency of the respective residential area. The diagnosis given below is the clinical diagnosis arrived at at times only after considerable follow-up examinations, as far as the Peoria City and County residents are concerned, and the radiological diagnosis in the case of residents of other counties, and such residents of Peoria as we were unable to examine because of their lack of cooperation with us.

Of the 13,547 people examined 111, or 0.81%, had significant tuberculosis. Among these, however, only in 22, or 0.16% of the total group, was the disease considered active. As far as the stage of the disease is concerned 15, or 68.1%, were minimal; six, or 27.2%, moderately and one, or 4.5%, far advanced. The sex distribution was 16 males, or 0.16% of the 9,924 males examined, and six females, or also 0.16% of the 3,623 females examined.

Of the 22 active cases 16 lived in Peoria City or County and six in other localities. Of the Peoria City and County residents four had a positive sputum either on direct smear or on guinea pig inoculation, or on culture. Of this group 13 were hospitalized in the Peoria Municipal Tuberculosis Sanitarium, two refused hospitalization and one transient individual moved away from the City.

The Survey of Medium-Sized and Small Industries

BECAUSE it was essential that the location of the x-ray unit be changed from day to day, or oftener if necessary, to visit these smaller industries, a second-hand housetrailer was purchased, adapted for the purpose by the personnel of the Sanitarium, and the unit was permanently installed in it.

This part of the survey was undertaken with the cooperation of the Industrial Committee of the Peoria Association of Commerce. As a matter of fact this Association contributed $150.00 towards the expense.

The Educational Director of the County Tuberculosis Association personally contacted the management of each industry, explained the purpose of the survey and wherever possible has made talks before the workers, or foremen. The house organs of the various industries and other avenues of publicity were amply utilized as previously outlined.

In the larger industries where the unit was stationed for a prolonged time the 14 x 17 films were retaken by the unit. In the small plants this was manifestly impossible. Here the films were retaken either by the City or County Chest Clinics. This procedure required a certain amount of time loss and inconvenience to the employees and a significant number did not avail themselves of the service which was offered.

All told 67 industrial plants and 10 other organizations participated in the survey. These varied in size from a mere handful of employees to 3,760. For various reasons, small night shifts when it was not economical to have the unit work, absentees, etc., even under the best cooperation no full participation was possible.

The percentage of participation was computed on the basis of employees who were present at the location at the time the unit was operating. Thus we found that, while these various organizations carried 18,335 people on their payroll, only 16,909, or 92.2%, were available at the time the survey was being conducted. The participation of the employees varied greatly at the various plants. It did depend entirely on the interest management displayed in the survey. The participation was the highest, 92% of those available at the time of the survey, at the Le Tourneau Company, the largest plant in the group employing 3,760 people, where the personnel manager, MR. V. A. NORTHDURFT, personally directed the participation of the employees.

All told 12,129 people participated in this survey. Of these 168, or 1.38%, were diagnosed with some form of pulmonary tuberculosis. Of these, however, only 36, or 0.29% of the total number examined, were considered as suffering from the active form of the disease. In the whole group 8,468 were males and of these 27, or 0.31%, were considered as suffering from active tuberculosis; and 3,661 were females and of these nine, or 0.24%, were so considered.

Of the group of 36 active cases 26, or 72.2%, were minimal; eight, or 22.2%, were moderately and two, or 5.5%, far advanced. Of the 36 active cases 11 Peoria City and County residents were admitted to the Sanitarium. In this group the sputum of four was positive for tubercle bacilli either on direct smear or by guinea pig inoculation, or culture.

Comparison Between the Groups

BECAUSE the two groups surveyed were comparable in size, we thought it of interest to compare the results found. All the sizable plants surveyed have a medical department; the larger the plant the better the program and more adequate the service rendered.

Only the Caterpillar Tractor Company, however, employs a full-time medical director with an adequate full-time medical staff who devote a considerable portion of their time to the practice of preventive medicine. The medical policies concerning tuberculosis control, followed by this plant have been outlined in the first part of this paper.

The Caterpillar Tractor Company group consisted of 13,547 and the smaller industries of 12,129 persons. The sex composition was 73.2% males in the first group and 69.8% in the second. The larger percentage of females in the second group is due to the fact that a number of plants in this group, such as distilleries and needle trades, employ preponderantly women employees. The age composition of both groups is given in Table 1. The Caterpillar group was slightly younger

TABLE 1. AGE COMPOSITION.

CATERPILLAR TRACTOR COMPANY			SMALLER INDUSTRIES	
Age Group	Number	Percentage	Number	Percentage
16-20	1,329	9.8	1,273	10.4
21-24	1,008	7.4	913	7.5
25-29	1,908	14.0	1,484	12.2
30-34	2,487	18.3	1,915	15.7
35-39	2,237	16.5	1,667	13.7
40-44	1,735	12.8	1,489	12.2
45-49	1,247	9.1	1,127	9.2
50-54	792	5.8	953	7.8
55-59	422	3.1	654	5.3
60-64	242	1.7	389	3.2
65-59	95	0.7	179	1.4
70 & over	26	0.1	69	0.5
Age Unknown	19	0.1	17	0.1
TOTAL	13,547	99.4	12,129	99.2

on the average than the group of smaller industries, the age group of 16-44 being 79.0% in the former and 72.0% in the latter.

As far as physical strain imposed on the worker is concerned the Caterpillar Tractor Company is a heavy industry, while most of the smaller plants belong to the lighter category. The percentage of active tuberculosis cases found was significantly lower in the Caterpillar Tractor Company group, 0.16%, than in the smaller industrial group, 0.29%. The percentage of minimal cases found was equally high in both groups.

Recently Selby[1] published the results found in a plant with 16,000 workers where for the past six years 47,424 chest x-ray examinations were made. He reports 0.18% active cases discovered. Our findings in the Caterpillar Tractor Company group compare favorably with these results.

We believe that the difference found in the two groups surveyed by us is due to the fact that the Medical Department of the Caterpillar Tractor Company maintains a more thorough medical selection at its pre-employment examination and closer supervision over its employees than do the smaller concerns.

It was easier to persuade the workers of the Caterpillar Tractor Company to enter the Sanatorium when such treatment was needed than the employees of the other plants, we believe, because their provisions for sickness insurance made such treatment a lesser economical burden for the former group than was the case with the latter.

Cases Discovered in Total Survey

OF THE 25,676 people surveyed 279, or 1.08%, were found with significant tuberculosis. Of these, however, only 58, or 0.22%, were considered as suffering from the active form of the disease.

There were 19,445 workers in the age group of 16-44 years. Among these 26, or 0.13%, had the disease in the active form. Of the remainder of 6,195 in the age group of 45 years old and older 32, or 0.51%, were suffering from active pulmonary tuberculosis (Table 2).

While the number of active cases found is relatively small, a significantly large group was discovered which is in need of close supervision by periodical re-examinations in order to prevent their disease becoming active and progressive.

TABLE 2.

AGE GROUP	NUMBER EXAMINED	ACTIVE CASES	
		Number	%
16-20	2,602	1	0.03
21-24	1,921	2	0.10
25-29	3,392	4	0.11
30-34	4,402	4	0.09
35-39	3,904	6	0.15
40-44	3,224	8	0.24
45-49	2,374	8	0.33
50-54	1,745	9	0.51
55-59	1,076	4	0.37
60-64	631	7	1.11
65-69	274	3	1.21
70 & over	95	1	1.05
Unknown	36	1	2.77
TOTAL	25,676	58	0.22

The Survey from the Standpoint of the Community

IN THE course of the two surveys 14,430 residents, 9,723 males and 4,707 females of the City of Peoria, were examined. On the basis of the 1940 Census when the City's population in the age groups of 15 years and older was 84,767, 17.02% of this population segment was examined in these surveys. According to sex these examinations covered 23.42% of the 41,520 males and 10.88% of the 43,247 females. Hence, a significant portion of the adult population has been screened by these two surveys.

Among the 14,430 residents examined 47 were found with active pulmonary tuberculosis, i.e., 0.32%. In the course of a much smaller number of selectees of the City of Peoria examined by the Induction Board in the year 1944, it was estimated that 0.36% were rejected because of active pulmonary tuberculosis.[2]

The percentage of active cases of tuberculosis found among the residents of the City in the two groups of the industrial population and of the selectees is so close and the number of people examined is sufficiently large, that we are justified in assuming that the median between the two percentages found, i.e. 0.34%, represents the percentage of active pulmonary tuberculosis in the age groups of 15 years old and older in the City's population.

Of the 36,316 residents of Peoria County (that portion of the County which lies outside of the limits of the City of Peoria) in the age group of 15 years old and older 3,153, or 8.68%, were examined in these surveys. According to sex 2,474 of those examined in

this age group were males and 679 females. Of the 18,678 male residents of the County in this age group 13.24% were thus examined. Those examined, we believe, represent the vast majority of the County's population who are engaged in industrial occupations.

Of the 3,153 people examined in this group three, or 0.10%, were found suffering from active pulmonary tuberculosis. This percentage is considerably lower than the percentage found among the residents of the City proper. This difference is due, to considerable extent we believe, to the much smaller number of County residents participating in the survey.

The publicity given this survey in the daily press has awakened considerable interest in the population at large which subsequently we had occasion to gauge. For instance, when a case of active tuberculosis was discovered among the employees of a large department store, these employees requested on their own accord a survey by the City Chest Clinic. In a second instance, such a survey was suggested by the physician of a public utility plant, when a case of active tuberculosis was discovered among the employees, and all of them voluntarily participated in a survey.

Among the farthest reaching effects of this survey was the decision of the Peoria County Tuberculosis Association to establish a photofluorographic unit in the largest hospital of the City which had close to 14,000 admissions in 1944. The Peoria Municipal Tuberculosis Sanitarium and the Peoria County Tuberculosis Sanatorium District will furnish the salary of the technician. All patients over 15 years of age admitted to the hospital will have a routine chest x-ray on admission. The films will be interpreted by the radiologist of the hospital. At the time of this writing the unit is already being installed. Because it is generally conceded that patients admitted to general hospitals constitute one of the largest pools of active cases of tuberculosis, we have reason to expect that with the establishment of this unit a most important avenue for tuberculosis case finding has been opened in Peoria, which will prove of lasting value in the years to come.

Discussion

THE success of an industrial survey depends on a number of important factors. Some of these are the following:

1. MANAGEMENT

It is obvious that the greatest number of employees will participate in such a survey if it is conducted in the plant during working hours, when the employee himself is not even inconvenienced. Such arrangement, however, calls for a certain amount of sacrifice on the part of management because of the time lost in production. While this time loss is entirely negligible as far as an individual employee is concerned, its sum total may represent a significant outlay in wages paid for which the employer has received no return. Hence, management makes a real and unselfish contribution to the welfare of its employees and the community when it permits such surveys to be conducted on company time. This contribution should always be recognized and appreciated.

In our experience at every plant the percentage of employee participation was in direct ratio to the enthusiasm displayed by management. It was not enough that the company permitted our unit to work in the plant and announced its working schedule to its employees. It was essential that it assign to the project one of its employees in an important position, who commanded the respect of the workers, to engender their interest and participation in the survey. Such an assignment, too, meant added expense on the part of the employer.

In our dealings with management we have found it always cooperative with, and in most instances enthusiastic about, our aims. We have found that the publication of the National Association of Manufacturers "Report on Industrial Health Practices"[3] was exceedingly helpful to us in securing the good will of the executives in charge.

Surveys have now been conducted in a large enough number of plants, the country over, so that the good they have accomplished in the interest of industry, labor and community welfare, could be objectively evaluated by the Medical Department of the National Association of Manufacturers and presented to the executives of the various industrial plants. Such presentation would be extremely helpful in securing the cooperation of many an executive who at present may be indifferent towards such surveys. The cooperation of the National Association of Manufacturers could also be greatly instrumental in inducing industry to make such surveys a recurring event instead of a passing demonstration.

2. LABOR

In our approach to labor we have followed the suggestions of plant management. In some of the plants the approach was made directly by management with or without our participation; in others, the approach was made directly by us.

Outsiders like ourselves and representatives of health organizations are not familiar with the management labor relationship existing in the different plants. It is, however, essential that they do not disturb this relationship. They can serve this object the best if in their approach to labor they follow the prevailing policy in a given plant.

The leaders of labor organizations have cooperated fully with our project. Yet, in most of the plants, this cooperation has lacked the enthusiasm displayed by management. Because surveys like ours serve first of all the welfare of labor, and because local unions in their actions are guided to the greatest extent by the leadership of their national organizations, we believe that directives by the national labor unions to their various locals in encouraging their participation in such health activities would enhance greatly the number of workers taking part in such examinations.

3. EDUCATIONAL PREPARATION

The educational campaign which should precede and be conducted concurrently with the survey must enlighten the employees about the importance tuberculosis plays in regard to their welfare. In this campaign every available publicity channel should be fully utilized.

In this respect the "house organs" occupy an important position. These represent a ready-made reading public which includes all the workers and friends of the plant. They serve an excellent medium through which health information can be easily spread. In our own experience the opportunities offered by these media are not used to full extent.

Health education, to be successful, must be conducted on a year around and systematic basis. Tuberculosis represents only one phase of the public health field. The National Health Council could render a distinct service if it would provide a clip-sheet service for the benefit of these house organs, which have reached a circulation of 40,000,000 readers, so we are informed. The house magazines have an excellent organization in the National Council of Industrial Editors. Annually this Council conducts contests in various branches of the publication field, such as the

cover page, content, etc. A prize offered by a national health organization for the best health page published could go far, we believe, in making such a page a popular feature among the competing editors.

4. CHARGES FOR THE EXAMINATIONS

In order that the employees participate in the largest possible number, the x-ray examinations must be conducted free of charge. Because tuberculosis is a public health problem and these surveys constitute an important part of the control measures, the expense connected with the surveys should be borne by the community either through the voluntary, or the official agencies, or, better yet, jointly by both. It is obvious, however, that if the various plants voluntarily offer to pay for the services rendered on a per capita employee basis, as is the case in some communities, or contribute a lump sum for the purchase of a unit and for other expenses, as it has been done in others, such contributions should be gratefully accepted with full recognition of such voluntary cooperation.

5. THE ROLE OF PRE-EMPLOYMENT EXAMINATIONS

Pre-employment examinations, if accompanied by chest x-ray examinations, play an important part in effective tuberculosis control. Such examinations serve first of all the interest of the employees, secondly that of industry and last but not least the welfare of the whole community. The comparison of the number of active cases found in the two groups covered by our survey shows conclusively that in the plants where wide use is being made of chest x-rays in the pre-employment examinations the number of active cases found at the time of the survey was significantly lower than in the others. The inclusion of routine chest x-ray examinations in pre-employment examinations should, therefore, be encouraged by all available means.

Because small business establishments cannot be expected to make such provisions, the welfare of their employees could best be served if such examinations would be regularly conducted at the local branch offices of the U. S. Employment Service. Under existing regulations, however, health organizations are not admitted to the premises of these branches. Yet, the clients of the U. S. Employment Service are recruited chiefly from the lower wage earning group, among whom the prevalence of tuberculosis is the highest. Hence, the U. S. Employment Service could render a distinct service to its clients by revising its present regulations and encouraging local organizations to establish health services instead of preventing them from doing so.

6. ANNUAL SURVEYS

Pre-employment examinations, however, serve only as the first screen in the effective control of tuberculosis in a given plant. In order that the gains achieved by this screening may be retained, the routine chest x-ray examinations must be made an annual affair. Already we have had to admit two patients with far advanced tuberculosis to the Sanitarium, whose chest condition was found normal in the survey one year previously. It can be, however, hardly expected that even the most progressive industrial medical department will be in a position to undertake such an annual review in a large plant. Such a review must become the obligation of the tuberculosis agencies of the community.

7. COOPERATION BETWEEN TUBERCULOSIS ORGANIZATIONS AND INDUSTRY

Such cooperation is essential to the effective control of tuberculosis in every community. Expert consultation service rendered free of charge in the interpretation of chest x-rays and in other pertinent matters by the representatives of the official agencies to industrial medical departments will go a long way to establish a friendly relationship, and will lead to the mutual understanding of the problems involved.

Because surveys of industrial workers are conducted at the financial sacrifice of management and with some disturbance in production, we feel that it is essential that the organizations conducting the survey do everything in their power to keep the workmen away from the bench for the shortest possible time.

By using roll films, no time is wasted in changing films as is the case with cut films. Roll films can be studied in a considerably shorter time than cut films. This time factor is of paramount importance when one has to read these films after a full work day, as we had to do. We are, therefore, strongly in favor of the roll film cameras. Advantage should also be taken, whenever possible, of the newest developments which cut down on the time consumed by taking x-ray films, such as the Morgan Timer, the motor driven camera and the long film roll, etc.[4] The better understanding the organization doing the survey shows towards the problems of management and the shorter the time used for x-raying an individual worker, the greater the likelihood that management will permit the repetition of the survey.

Important as even a single survey is to case finding, it still should be looked upon only as a demonstration. Only when such surveys will be conducted repeatedly within reasonable time intervals will they be fully utilized in the ultimate successful control of tuberculosis. It cannot, therefore, be emphasized strongly enough that all efforts be made on the part of the organizations connected with a survey that the examinations proceed smoothly and with the fullest dispatch.

Summary

THE results of a tuberculosis survey covering 25,676 industrial workers were presented. The incidence of significant tuberculosis found was 1.08%. Active pulmonary tuberculosis was discovered in 0.22% of the workers examined. The incidence of active tuberculosis was 0.13% in the age group of 16 to 44 years and 0.51% in the age group of 45 years old and older.

2. The role of industrial pre-employment examinations in tuberculosis case finding is emphasized.

3. The case incidence of active tuberculosis was about half as high, 0.16%, in the plant which utilizes chest x-rays in the course of pre-employment examinations, though not routinely, than in the group in which this is not the practice, 0.29%.

4. The importance of industrial surveys from the standpoint of community welfare has been shown. Considering the groups surveyed as sampling, the case incidence of active pulmonary tuberculosis in the population group of 15 years old and older was estimated as 0.32% in an industrial community of over 100,000 population.

5. In order that industrial surveys may be more generally utilized it is suggested that the Medical Department of National Manufacturers' Association make a comprehensive study of the industrial surveys already conducted and circularize among industrialists the conclusions reached, and so popularize the idea of annual surveys among industrial managers.

6. It is suggested that "house organs" published by various plants be better utilized for health education among workers.

7. A more direct stand on the part of national labor organizations in favor of such surveys could lead to a greater participation of organized labor and thus to its better health protection.

8. The advantages of the roll film camera and other developments in photofluorography in speeding up mass surveys were pointed out.

9. It is suggested that tuberculosis surveys of the industrial plants be repeated regularly by the tuberculosis agencies of the community, at no expense of the employees or management.

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Simple Guides for History Taking

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THE following discussion is intended as a guide for sound practices in case history recording in the industrial dispensary. These comments apply regardless of the form in which the record is kept, whether in visible or invisible files, on cards or in folders, or in daybook entries.

The principles laid down attempt only to describe the essentials of case recording, representing an adequate, irreducible minimum.

1. WITH EACH ENTRY OF A DATE, INCLUDE THE YEAR. The fact that the year is recorded in a previous entry is not sufficient, as there are employees who may go a year between visits.

2. THE HISTORY SHOULD DESCRIBE THE WHEN, WHERE, HOW, WHAT, AND THE TREATMENT OR DISPOSITION OF EACH CLAIMED INJURY. This does not require a lengthy entry. For example:

"WHEN?"
"Yesterday morning about 2:00 A.M."
"About 10 days ago."
"Sometime last September."
"June 18."
"The night before last."
"Five years ago."

These are all sufficiently descriptive. The exact date becomes extremely important in regard to the statute of limitations. (In Tennessee the difference between 29 days and 31 may reverse a claim.) If the incident is compensable, then the establishing of the exact date, if possible, becomes essential. The exact date is also occasionally important when the appearance of the wound is not in keeping with the date of the stated injury.

"WHERE?"
"At home."
"On steps of main office building."
"At patient's station."
"At street corner while catching bus," etc.

These give a clear picture as to whether or not the injury was received on the employer's property. No great elaboration is required to indicate that the injury was received away from the property but in the course of employment such as:

"At town post office where sent to mail special delivery letter,"

or "At Blank Hardware Store where ordered to pick up needed parts."

"HOW?"
"Slipped on oiled spot on floor."
"Struck hand against lever of machine."
"Hit head against low beam."
"Fell off ladder while painting cornice," etc.

Not only is this information necessary, but the earlier the history is obtained, the truer the picture. Time alters a story, since rationalization and wishful thinking in time impair veracity. This is probably the most important point in history taking. Its neglect is irreparable in many instances.

"WHAT?"
"Blister, tip of ring finger, right hand."
"Pain, swelling, and tenderness proximal phalanx of the left thumb."
"Swelling, tenderness, limitation of motion of left wrist joint."
"Pain, limitation of motion lower lumbar region."
"Infected abrasion dorsum of left foot."
"Sub-ungual hematoma, little finger, right."
"Deep laceration, three inches long, external surface, middle third, right thigh," etc.

It will be noted in most of the instances above that the presenting symptoms or signs are described without diagnosis. This is stressed for two reasons. The first reason is that it is legitimately within the nurse's function to describe the symptoms and lesions. It is not her function to diagnose. The second reason is that a snapshot diagnosis may cause her later embarrassment. The swollen, painful wrist joint may be traumatic, but it also might prove to be arthritic. The lower lumbar pain may turn out to be due to a metastasis of the spine, and if originally diagnosed as a "sprain," the fatal termination may prove difficult to explain. The word "contusion" requires particularly careful scrutiny, being used too frequently when there are no signs to support its diagnosis.

It must be emphasized that the employee is better protected by a true descripiton of the condition, since future settlement of his claim will not be left to a snapshot, and possibly erroneous, diagnosis.

"TREATMENT OR DISPOSITION?"
"Blank compound tablets dispensed."
"Foreign body removed."
"Advised."
"Referred to home M.D."
"To report for further observation."
"Discussed with personnel counselor."

The treatment or the disposition of every case should be recorded. "Disposition" is a broad and useful term. The word "Treatment" is inadequate in many instances, since one of the greatest functions of the industrial physician is to keep his patient adjusted to the working environment. This calls for many dispositions of case which cannot be said to have been treated in the narrow sense of medication or dressing.

While record keeping of non-industrial cases or personal illnesses requires slight modification of the above guides, the principles are identical. The history should

identify the complaint as being non-industrial, tell how long it has existed, give a picture of the condition, and describe the treatment or the disposition.

In all recording of the "WHEN," the "WHERE," and the "HOW," in as far as practical, the patient's own language should be used. The word "states" is extremely useful, as is also the phrase "the patient believes." It is a fact that "The patient states, 'Three little red devils came in the office window and burned him with their pitchforks,'" even though the incident is obviously fiction. It must be recorded that a patient "believes that sitting beside an open window caused his coronary thrombosis." The fact that the physician believes there is no causal connection alters neither the patient's belief nor his right to enter a claim. The fact that neither of these claims will be allowed should not prevent their entry being made on the record.

If the patient's statements are not identified by such phrases as "patient states," or "patient believes," there is danger of their being interpreted as the belief of the physician or the nurse, and embarrassment could result. It is not the function of the physician or the nurse to settle claims. They record the facts on which claims will finally be settled by the courts, or the commissions set up for this purpose.

In reporting treatment or disposition of the case, it is frequently important to make a note as to when the patient was advised to return. This is a protection against any accusation of neglect and an indication as to whether the patient is following treatment conscientiously. It will be of great value when an individual wishes to prolong disability and does so by reporting only after a prolonged absence without having received or sought further treatment.

Any unusual incident in connection with any case should be recorded. This includes attitudes of belligerency, any mishap in treatment, or any event or circumstance which might later attract attention or give rise to questioning. One note made at the time may carry more weight than a page of explanation written later.

Each of the staff who interviews or treats the patient should be responsible for an entry. If a chart indicates that a patient was referred by a nurse to a physician, or by a physician to another physician, the reason should be given. *It is then the responsibility of the physician to whom the patient is referred to make his own entry.* It may be that all that will be necessary is "Above findings confirmed," or some such simple statement, but some record is essential.

Each entry by either a nurse or a physician must be signed. Practice may vary as to whether or not initials will be accepted as a signature, and in general, they are likely to be so accepted. Some positive identification, however, must be in evidence. It may be difficult enough to identify initials some time later. It is virtually impossible to identify positively the handwriting only of some nurse or physician who may have long since left the company's employ.

A minimum, adequate record is essential to the interests of the employee, the employer, the nurse, and the physician. To state that such is impractical on the grounds that it takes too much time is unreasonable. Those who have had the experience of attempting to piece together a story which was improperly recorded know the loss of time involved by this effort. Not only is it fruitless many times; but even when facts are elicited, they lack weight when unsubstantiated by the records. The time saved by preventing a few cases of this type will more than compensate for that required in making a minimum, adequate record on all cases.

Trial by Ordeal

—From an Industrialist's Viewpoint—

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IN MEDIEVAL Europe, down to the 13th or 14th Century, it was common to try persons accused of crime by some such ordeal as making them walk through fire or over live coals or red-hot irons. If they came through unscathed, they were freed. That practice had been inherited from long ages of primitive life. Perhaps it was related to the fact that the tribes which had successfully met severe crises, great challenges, had shown capacity not only for survival but also for growth in civilization. The ordeal that tried their souls nerved them for steps forward.

The Postwar Challenge

WE ARE going through the terrible ordeal of war. We are not a war-minded people. This war was not of our seeking, and more than ever we intend to do our utmost that such a war shall never come again. Out of the waste and suffering and sacrifice of it we should resolve, however, to save the spirit of enterprise and cooperation in which our people have met its challenge and direct it to the work of reconstruction and advancement.

For we shall emerge from the war, not merely with great losses we shall need a long time to repair or cannot repair at all, but also with great resources we did not have or were not using before—resources of inestimable value for repairing our losses and reaching new levels of living.

The productive capacity of the nation's industries for civilian purposes will have increased enormously. In steel, aluminum, magnesium; in petroleum and products of petroleum; in plastics, synthetic fibers, rubber, nitrates, hydrocarbons, and scores of chemical products; in electric power—in none of these fields were we using our full capacity before the war, and now that capacity has been greatly increased. Research and invention have been accelerated; in such fields as plastics, fuels, electronics, alloys, and many others, we have made greater advances in three or four years than would have been expected in 20 or 30 years. The nation's need, the world-wide need, for what we can thus produce is accumulating. Our capacity is not in excess of the potential market.

In the application of synthetic organic chemistry to preventive and remedial medicine, in methods of treatment of wounds and sickness, the advances made in these few years, may ultimately outweigh many times even the staggering losses of the world-wide conflagration.

Yet the usefulness of all these gains in resources depends upon an advance in human relations. It requires an increasing degree of organization and cooperation to utilize this expanded productive capacity, as well as to distribute the products where they are needed. It requires organization and cooperation, beyond any ever achieved before, to keep the market in such balance that exchange of goods and services will be continuous, that producers may use one another's product, and that all may go on producing. That is a matter of human relations.

With our increased mastery of the materials and forces of Nature comes the challenge of cooperation

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to use our human resources as efficiently as we know how to use our material resources—as efficiently as is necessary to keep the wheels of our economic system turning and maintain the era of peace and prosperity which is so tantalizingly, so obviously, within our reach.

In human relations, in organization and cooperation of human resources, the ordeal of war has brought us clearer understanding and unquestionable achievement. That aspect of our postwar prospect, however, seems to me to involve a challenge as great as that faced by our forefathers in overcoming the unfriendly because unknown elements of Nature in an unexplored continent, or the challenge of this World War to which we of the United Nations have been making so vigorous a cooperative response. I wish to discuss both this achievement and this challenge, within the limits of my own experience and observation.

Production Still a Human Undertaking

THE tremendous changes in methods of production that have taken place during the past 100 years, even those within our own time, have not altered the fact that production of goods and services is still a very human undertaking.

With the discovery of the potentialities of harnessed power and the invention of automatic or semi-automatic machinery, so that manufactured goods seemed in many industries to be the product less of men than of machines, it was not strange that many managers of industry gave less constructive thought to the improvement of human relations than to the benefit of mass production. Yet steam-powered and electric-powered machines were but new tools for men's use, and the use of them required adjustments in industrial relations—especially since mass production brought together in one organization larger numbers of workers with greater division of labor, which in turn increased the importance of cooperation.

The worker's sense of participation, of personal importance, was reduced as he ceased to be a handcraftsman and became a machine tender, as he no longer saw a completed useful product as his output, as he was removed farther and farther from contact with responsible management. Sometimes he regarded himself as a mere automaton, with a number, in the production line, or believed himself so regarded by others. Actually he was still an important factor in the enterprise. His productivity, indeed, had been greatly increased even though his individual part in its production was less obvious. If the often widely scattered ownership of the industry made his relation to owners seem remote and impersonal, if the size of the organization prevented close contact with the upper levels of management, if the market was so widespread or specialized that he had no personal appreciation of customers' demands or the impact of competition—those conditions did not affect the reality of his contribution to the achievement which he shared. What often seemed to him lacking was recognition of his personal status as a factor in a common enterprise.

Status is a very important thing. It involves how you stand in your family, for instance—what your wife and children think of you, and how it is expressed. It involves your standing among your neighbors and acquaintances in your community. It involves your employer's and your fellow-employees' attitude toward you, and how they show it. Recognition of one's personal worth, of the importance of one's work, of one's really belonging to the group with which he is associated, is a value in life that is rated high, consciously or unconsciously, by nearly every human being.

Industrial Management Begins to Take Note

IT WAS about 25 years ago that the term "personnel administration" was given currency in a widely circulated book. Of course there had been personnel administration under other names before that time; it has always been an important responsibility of business management, whether in a shop with one employee or in a large establishment. But within the past 25 years increasingly intelligent attention has been given by employers to the mental attitude, the morale, of employees and to analysis of the factors entering into the employer-employee relations.

This movement has been due in part, I suspect, to (1) the increasing sense of social responsibility on the part of management—the passing of the "public be damned" attitude still occasionally expressed by old-time "rugged individualists"; (2) the growth of a general concern about inequities in our economic arrangements and the status of underprivileged groups; (3) the increased strength of organized labor and the spread of industrial conflict; and (4) the publicizing of various outstanding examples of well established relations between employers and employees in corporations large and small.

Yet the main factor has undoubtedly been the need of increasing the effectiveness of human labor under changing conditions. In the book to which I previously referred, by Ordway Tead and Henry C. Metcalf, industrial management was said to be on the threshold of a new method and a new evaluation of administrative ability. "The new focus in administration is to be the human element. The new center of attention and solicitude is the individual person, the worker. And this change comes about fundamentally for no sentimental reasons, but because the enlistment of human cooperation, of the interest and goodwill of the workers, has become the crux of the production problem."

Anyone looking back over this period of 25 years cannot but be impressed with the changed attitude of management generally toward this problem. The greater majority of the managers of industry and business have become aware of the importance of recognizing the personalities of all workers in an enterprise—that their good will and loyalty and maximum effort cannot be commanded but must be won—that wise leadership rather than arbitrary dictatorship is the function of management.

Let me quote a statement made many years ago by a noted leader of men, Charles M. Schwab, with whom I was fortunate enough to be associated during the first World War. It illustrates the view of a forward-looking business manager that has come to be widely shared and widely applied: "We have got to work out a plan whereby men, even in the subordinate ranks, may obtain some sense of achievement out of routine tasks. We have got to devote ourselves to the problem of making men happy, not through making life soft and easy, but in so using the implements and facilities that science has placed at our disposal that men through their work can realize a larger life and take a greater zest in their workmanship."

In those years between the two world wars great advances were made in personnel management and employment relations. It was found that a modern industrial plant needed the services of a physician and nurses, not only to treat the victims of accident or sickness but also for many types of preventive effort, both group and individual. The Western Electric Company's Hawthorne experiment showed in concrete terms the relation between recognition of personality and productive efficiency. It was in this period that the unique opportunities of supervisors to influence the relations

between employer and employees began to be appreciated, and supervisory training was instituted. Personnel management gained recognition as a specialized profession, with broadening responsibilities. These were but a few of many evidences of an increasing recognition that mechanical production must forever be controlled and directed by human beings, and that a relationship of mutual respect and understanding between management and workers is industry's greatest asset.

Various organizations have made important contributions to the development of the spirit and techniques that have made possible the notable progress in this field. Among them are the American Management Association, the National Industrial Conference Board, the National Association of Manufacturers, and the Personnel Research Foundation—not to mention the countless industrial corporations whose efforts to establish better relations between employer and employees have built up a body of valuable experience.

The effect of this changing relationship has been manifest during the tremendous productive effort the present war has called forth. In spite of unfortunate conflicts and strikes that have made headlines, we know that we could not have achieved our miracles of production without an unprecedented degree of cooperation within industry. That cooperation we must save and extend for achievement of the better America we all seek.

Wartime Progress

THE onset of the present World War magnified the problem of human relations in industry. My own work on the War Production Board has intensified my realization of this problem. It has been the responsibility of the Conservation Division, of which I am Director, to find ways and means of assuring the military requirements of the Armed Services and the minimum civilian necessities as well, in spite of shortages of materials, production facilities, manpower, and transportation. We accomplished this by suggesting substitution of available materials for those that were critically short, where such substitution is practical; by eliminating types, sizes, colors, finishes, through the technique of simplification; by writing specifications that would fulfill the engineering requisites with a minimum use of materials and labor; by setting standards to accomplish interchangeability, speed of assembly, and to reduce the requirements for repair parts. The savings that have been accomplished have been amazing; yet in almost every case it was in mass production that these techniques were to be applied. Their effect, therefore, was to increase the need of rapid development of the humanizing element that is essential to obtain the fullest value of mass production.

Many examples could be cited of actions necessitated by the war that have highlighted human relationships. Perhaps the outstanding one has been the search for manpower. Not only were millions of employees, executives and supervisors as well as wage-workers, withdrawn from industry for war service, and their work of necessity redistributed, but in industries converted to war production, and in new plants established for war production, millions of workers had to be trained for and adjusted to new tasks—including a vast number, both men and women, without previous factory experience.

You do not need to be reminded how shipyards, airplane and tank plants, and countless other establishments for making all manner of war supplies sprang up like mushrooms in many areas—how existing plants or even warehouses were transformed into enterprises that drew thousands of workers from other occupations or from no occupation at all. Ever since the summer of 1940 this has been going on. Total employment in manufacturing increased from 10.5 million in 1939 to 16.5 million in 1943, and those figures of course do not begin to measure the shifts in employment during those years.

These conditions required wider application of the previous progress in personnel management—in selection, placement, and training of both employees and supervisors. In the magnitude and urgency of the productive task, in the unavoidable confusion of rapid readjustment of a nation's industry, with the shortage of competent personnel directors, human problems in many plants did not for a time receive adequate attention; but the importance of personnel management was thereby more strongly emphasized and became a matter of greater concern than ever before. The result was an accelerated development of techniques and staffs in this field, more pooling and appraisal of experience, and—what is more important—a growing sense of what it takes to create mutual understanding and loyal cooperation.

Let me mention some phases of personnel management in which I believe the advances have been most notable.

1. In the selection and placement of employees we have developed better techniques and more understanding. The necessity of employing anybody who came along and putting him at work wherever there was a shortage has increased employers' interest in improved ways of determining aptitudes and of orientation of new employees.

2. Extensive plans of training within industry have been formulated and put into operation. The War Manpower Commission has done much to publicize and correlate the experience of industries with such training. From "vestibule" training the process continues into the subsequent relationships, where education, supervision, and management must be combined, as concurrent and inseparable functions of employers in contact with employees.

3. Special attention has been given to the training of supervisors. The foreman holds the first line of contact between employees and management. To many workers the foreman is the company; his attitude is the Company's attitude. We have learned a good deal in these war years about the importance of the foreman determining shop morale.

4. Recognition of the fundamental importance of personnel management and industrial relations departments has greatly increased. To the old-timers, this feature of a company's organization often appeared to be sort of vermiform appendix on the organization chart. To them it seemed difficult to find anything for it to do without unwelcome interference with their functions. From top management to foreman, almost no one welcomed advice about human relations within its field of responsibility or intrusion into an area which he felt fully competent to handle. That distrust of personnel specialists has been removed to a large extent by wartime experiences, in which their help has often been found indispensable. Personnel departments are being closely integrated into company organization, as providing social engineering that must be applied throughout a company's activity.

5. The extension of personal counseling, mainly to help individuals to help themselves, but also to acquire an intimate understanding of employees' problems affecting their morale, and to assist in interpreting management policies and practices. Discontent is like

an infectious disease; if not cured, it may spread through an entire department, even through an entire plant. It may come from maladjustment to the job; it may come from inherent timidity, or even from unsolved personal problems of unhappiness at home. To the wise counselor, such a mental condition is quickly apparent and can usually be remedied by sympathetic understanding advice.

6. It is being recognized also that responsibility for good relations within an industry must come from the top—it cannot be shoved off on a personnel manager or an industrial relations department without executive support and direction. An eminent expert in this field, Thomas G. Spates, has given us this definition: "Sound personnel administration means so organizing and treating people at work that they will utilize their maximum individual capacities, thereby attaining maximum personal and group satisfaction and rendering their maximum service to the enterprise of which they are a part." Obviously that calls for enlightened personnel management throughout an organization, from top executives in their private offices to lead men in the shops. Otherwise much of the work of personnel specialists will be in vain!

7. Nor can there be any question, I believe, that in thousands of industrial enterprises, during the war years, more concrete efforts than ever before have been made to cultivate among employees a sense of participation—to cultivate it not by words but by acts.

An experienced observer of industry, Stuart Chase, reported last year his observations in a number of war plants. In some of them he noted that "the latent energy, good will, and intelligence of workers" were coming out in suggestions of technical improvements and for cooperation to increase productivity. In these plants where mutual understanding between management and labor prevails, "a great mine of human effort," he believes, is being tapped on a scale never before attempted—for the benefit of workers, management, and the whole country. "Will the mine close when the war ends?" he asks. In talking with many employers and employees, he is assured it will not. In this cooperation, they told him, "something too valuable has been developed to be laid aside."

The Returning Service Man

WHAT of the returning Service Man? What will he expect? What are industry's plans for him?

There can be no doubt that the fearful ordeal through which the Service Man is going should toughen his fiber, broaden his experience, quicken his judgment, expand his leadership abilities. Many will expect recognition of these qualifications. Industry appreciates their importance and is preparing to use them.

It would be unrealistic, however, to claim that there will be better jobs for all the returning soldiers. It would also be unwise to assume that all or even most of the returning soldiers will have been fitted by their war experiences for the jobs in which they would like to be employed. Their skills and aptitudes, in many cases, will not be applicable to civilian life. Yet, in looking forward to the return of these veterans, progressive management is planning to make use of the lessons taught them by their manpower problems of the past few years. Methods have been worked out to discover individual aptitudes. Courses are being developed to provide the specialized training to capitalize these aptitudes.

Never in my 40 years in industry have I found an excess supply of men and women prepared for rapid advancement through personal characteristics, latent abilities, and willingness to assume responsibility—all prime requisites of leadership. Industry needs men and women with the type of courage, integrity, and dependability which war experiences have generated.

Some Conditions of Cooperation

IF MANAGEMENT consists simply in getting things done through the efforts of other people, it has two major responsibilities: (1) deciding what is to be done—that is, planning—and (2) control in such ways as will induce people to cooperate in accordance with the plan.

In a recent book on production management it is noted that "efficient management in all its forms centers upon the problem of the best way of using all the energies concerned in the industry. The most important form of energy is embodied in the *minds* of the people concerned. The executive who could utilize all the mental energy in a modern plant for purposes of production would attain a degree of efficiency far beyond any reached in the most perfectly organized industry now existing."

So the ever-present problem of management is to get this output of mental energy by winning and keeping the largest possible measure of good will and loyalty.

This means that management must ever keep in mind the fundamental emotions that make for cooperation.

Pride in one's work is one of those emotions. It was perhaps once more common than now. Yet the modern factory employee, working under the far more comfortable conditions, with tools far more efficient, with the road to individual and associated achievement smoothed in countless ways, has a better opportunity to gratify his instinct toward good craftsmanship than the worker of any previous generation. It is up to management to use every possible means to recognize that instinct and give workers opportunity to feel that pride in their work.

I have already mentioned the importance of personal status. It cannot be too strongly emphasized. Workers want their individual work to be invested with increasing responsibility, to be recognized as important, and to provide opportunity for them to take part more consciously and constructively in the cooperative enterprise.

One of the most constructive actions taken by the War Production Board was the creation of Labor Management Committees. While, at first, there was a misunderstanding of the functions of these committees which delayed their progress, these difficulties were soon resolved. The fact that both management and Labor members of these committees are aiming at the same goal, that of increased production, and are not concerned with the controversial aspects of collective bargaining, has made their deliberations outstandingly worth while. With 5,000 such committees now actively at work on programs that are self-educational, a vast reservoir of helpful information and an army of men and women trained in the art of effective cooperation are being created in a way that should go far toward smoothing the path of postwar human relationships.

And the group instinct is of greater importance than ever as the work of the world comes to be done more and more by fairly large, closely organized groups working together. It is futile to try to discourage or suppress normal personal relations among them, normal manifestations of this instinct. To make every possible effort to use the impulse as a helpful force in building up the business is the course of enlightened management. To employ other tactics, may promote

division, mutual suspicion or jealousy, even class feeling, whether so intended or not, is to invite eventual expression of the group instinct in ways hostile to management.

Reason operates best on human conduct when violence has not been done to instincts, habits, or emotions. Cooperation is achieved only through mutual understanding. Industry is people at work.

Trial by Ordeal

—From a Neuropsychiatrist's Viewpoint—

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WHAT are the problems to be met in the reassimilation of our 12,000,000 returning men? How can we aid the individual soldier in using the capabilities he has acquired from his preliminary training and combat experience? How can we help to smooth the paths of those who have acquired personality alterations as a result of the hardships and tragedies to which they have been exposed?

I cannot answer these questions, but will attempt to give them some consideration from the point of view of a neuropsychiatrist.

For purposes of discussion the returning veterans may be classified into three groups:

1. The normal group, some of whom will have simple adjustment problems.
2. Those with personality alterations severe enough to require hospitalization.
3. Those with physical handicaps.

In the normal group there will be some adjustment problems. In order to aid them we must understand their wishes, and foresee their difficulties.

Suitable employment is their principal desire. They are hoping to be able to use the knowledge they have gained from their specialized training, and expect employment which will furnish adequate remuneration. They desire to have a prominent part in the development of a free and prosperous America. They are, of course, insistent upon a lasting peace, one which will keep their children from the participation they have been forced to undergo.

For the purpose of promoting their objectives and safeguarding their rights they have organized the American Veterans Committee. This organization will doubtless have strong political potentialities. Steps have also been taken for the formation of an International Veterans Council, which should go far in influencing their respective nations to observe their treaties and international obligations.

I sincerely hope that the American Veterans Committee will actively engage itself in cooperation with civilians in solving the many and serious problems which are bound to arise after the war. Little sound benefit can be hoped from its activities should it develop into another pressure group seeking special advantages for veterans at the expense of the remaining population.

Legislation conceived as veterans' aid should be passed only upon long and full consideration, or it may prove injurious to those whom it sought to benefit. In this regard, I believe the Hampton-Devaney proposed Constitutional amendment—if passed—would not alone deprive thousands of citizens of their just rights, but will produce unfair discrimination among the veterans themselves.

Given at Long Island College of Medicine Third Post-graduate Course in Industrial Medicine, week of October 30-November 3, 1944.

The Hampton-Devaney proposal would amend the Constitution to grant preferential appointment and promotion in the Civil Service of the state and all local governments, primarily to disabled veterans, and then to all other veterans regardless of their ratings in Civil Service examinations. It also provides that all non-veterans must be discharged from their positions, if necessity requires a reduction of employees, before any veteran is laid off. In other words, an employee with 25 years of service would be discharged prior to a veteran of a few weeks' employment.

This amendment, if passed, would not only lower the standards, but would completely destroy the merits of the Civil Service in New York. With this preference granted to all soldiers, it is estimated that all available Civil Service appointments would go to veterans for the next 20 years. This is not the place to dwell further on this proposed legislation, but all citizens who are interested in the preservation of our institutions should inform themselves of this pending legislation. I might add that the American Veterans Association is against its enactment.

There cannot be the slightest question that the veterans should be given all preferment possible without entirely disregarding the merit system. Veterans must be integrated into all forms of employment, not as perpetual holders of special privilege, or as a separate class, but insinuated as an indispensable part of the organization. They must be led to realize that their own interests are best served by measures which will benefit all of the workers, and under management which will give them every advantage that does not interfere with the just rights of the other employees.

When employment is obtained, the individual veteran should be encouraged by the employment personnel to bring all problems to his office. If he is concerned with unsatisfactory domestic relationships, he should be furnished with professional aid; or if the difficulty is work maladjustment, he should be treated with kindness and understanding and led to feel that the personnel management is the agency where he will be helped and that he does not have to appeal to his veterans organization.

From the school of war the soldiers have learned the benefits of friendship, the artificiality of social barriers, the necessity of cooperation, the value of ingenuity, and the art of improvisation—all most valuable assets. In addition, they have acquired self-discipline, and an understanding of the advantages of obeying orders and observing regulations.

The personality perfection, mental and emotional maturity, produced by war in one individual is well recorded in the following letter written by Lt. Dale W. Noyes, to his family, and published in the *Culver Alumnus* of September, 1944:

"Every once in a while I get to thinking about me and this war—I mean whether I will come back or not. I hardly know how to say this, but I guess I should think about it since they say a rifle platoon leader has a most dangerous job. . . . There are a few things I I would like you and Mother to know if I don't get back. First I want you to know that you have treated me the best that any Mother and Father could treat a son, and I haven't been nearly grateful enough for it. I wish there was some way I could make it up to you. And if I don't come back, please don't think 'He was so young and had so much of the world and life to see.' I am 20 years old, but I have gotten as much from life as a lot of people do in 70 or 80 years."

Just a few days later Lt. Noyes wrote, "By this time you should have my last letter. . . . It did me no end of good to get it off my chest. I started feeling

better right away. Now I think I feel better than I have felt in my whole life. I haven't any worries whatsoever, and no matter what I am given to do I go ahead and do it without the least feeling of resentment." Lt. Noyes was killed in action in France on June the 12th.

Unfortunately the attitude of many of the men is not as completely satisfactory as this. In talking with many of them there is found a feeling of resentment toward those at home who have not shared the dangers and deprivations they have undergone. They are depressed by our complaints of minor inconveniences, our economic successes attained without particular hardships, the lavish spending of our new found wealth resulting in a sharp rise in the prices of necessities, and of luxuries as well. They resent our light heartedness and our loud and tumultuous amusements. Many a lad has looked forward with pleasant anticipation to his furlough and a visit to New York, but after a few days here wishes he were back at the front where comradeship, universal friendliness and equality are to be found.

In one center, the returning members of the armed forces were so disturbed by our glittering vulgarity, the military authorities found it necessary to inform each incoming group that the people and the life they observed on the beaches, in the bars and in the night clubs, are not truly representative of wartime America, but a noisy and obvious minority; a glaring camouflage which obscures the substantial and industrious majority of the American people.

We have little difficulty in understanding this attitude of hostility, but unless corrected it has unpleasant potentialities to the future unity of this country. This displeasure is directed not entirely to civilians and to workers in essential industry, but also to men in uniform who have been forced, mainly against their wishes, to remain in this country.

To surmount this feeling of resentment will not be easy, and will require patience and friendly understanding. The burden of the readjustment will fall largely upon the women of this country—the wives, mothers and sweethearts of the returning men. Unfortunately many wives of soldiers have themselves suffered great hardships. They have found it necessary to obtain employment in shops and factories, as well as undertaking the care of their children. Some of them have developed disabling and even chronic illnesses. For example: Mrs. H. H., 25 years of age, has a child two years old. Her husband is serving in the armed forces in France. She found it necessary to work for the support of herself and the child, and obtained employment in a factory where a poisonous chemical substance is made. Her function was to fill bottles with this liquid, using a rubber tube which was clamped off with the fingers. In August, 1944, she reported that she was losing the sensation in the fingers of both hands. A week later she suffered headache, weakness, dizziness, disturbance of vision, loss of power and coordination in her legs which produced staggering when she attempted to walk. On examination October 21 she presented the usual manifestations of peripheral neuritis. Recovery from poisoning with this substance is always slow and may not be complete. This unfortunate soldier's wife came to this country from Czechoslovakia seven years ago, and all of her relatives are still in Europe. Her returning husband—if he does return—may have cause for bitterness for our failure to afford his wife proper industrial protection.

Many others have developed chronic illnesses, the ordinary heritage of life. Mrs. A. B., while working in a defense plant, noticed weakness and stiffness in her legs and increasing difficulty in walking. Walking became so difficult she was forced to give up her position and obtain employment as a cashier in a restaurant. Soon she became so depressed and worried over her increasing disability she had to discontinue all occupation. Examination proved her to be suffering from multiple sclerosis, a chronic disabling disorder, as to the cause of which we are in ignorance, but certainly without relation to occupation.

It is clear that much assistance will be needed in the readjustment of family relationships after the war. The task is too great for the professional personnel in and out of the armed services.

The women who have given invaluable service in the Red Cross, in hospitals, in the U.S.O., and in many other agencies, should be mobilized to help undertake this task. These workers would be most useful in caring for individuals suffering from maladjustment problems. Many of the returning soldiers will be fearful, moody, restless and depressed, and have other personality deviations which will make it very difficult for them to accept domestic responsibilities.

Courses in the technic of rehabilitation and psychiatric readjustment should be conducted, as were classes of instruction in first aid at the beginning of the war. Information gained in this way would not alone aid the individual student in the care of others, but would also be a nucleus for the dissemination of correct principles of mental hygiene.

Veterans with psychoses and severe psychoneuroses will be hospitalized in military establishments, and it is probable that they will not be discharged until recovery is sufficient for employment.

Experience has shown that many individuals with severe psychoneuroses induced by war, recover rapidly when the patient is removed from the scene of action.

In a study of 398 instances of "nervous breakdown" occurring in the British Navy, Tooth[1] found there were two groups of precipitating factors; the strain of war, and domestic difficulties. War causes were responsible for 75%, and domestic worries for 25%. Moreover, when anxiety concerning domestic situations was the determining factor, 35% were invalided, unable to return to duty; while only 25% of those whose illnesses arose from war hazards were not returned to action. Of the causes of domestic worry, suspected infidelity of a wife or fiancee headed the list by a large margin. Illness or death of near relatives was of next importance, while "financial stress and more concrete situational problems" gave little trouble. These findings may well be pondered by those of us at home who are anxious to play a part in the successful prosecution of the war and are concerned for the health and well being of our returning heroes.

For veterans with physical handicaps the War Department maintains the best establishments for rehabilitation to be found anywhere in the world. The basis of the treatment consists in the application of measures adapted to strengthen atrophied muscles, freeing stiffened joints and restoring function by therapeutic exercise. In order to develop work interest the individual is given his own choice of the form of manual activity—work with tools, farming, manual labor, etc. Where he has suffered more serious disability as in the loss of a hand or limb, he is trained for occupation where this particular incapacity will be no serious handicap. The individual is led to realize that he will be a normal useful member of society.

Physical disabilities frequently cause psycho-

1. TOOTH, GEOFFREY: Nervous Breakdown in the Navy. *Brit. Med. J.*, March 11, 1944, pp. 358-360.

neuroses, and measures for their alleviation are also conducted at these rehabilitation centers.

Eighty to 90% of the men cared for in these centers are returned to active service or enabled to find employment. Many employers have found that the self-confidence, willingness to observe orders and regulations, and to cooperate with other workers learned by the veterans more than offset their physical handicaps or inexperience.

We confidently hope that Civil Authorities will see the value of these institutions, and will establish similar rehabilitation centers for the care of those suffering industrial disabilities. Proper equipment for the restoration of many injured workers is sadly lacking, with the result that unnecessarily large sums are paid by insurance carriers to individuals who could be returned to useful employment.

I cannot leave the subject of employment without saying a few words concerning the men who are found unacceptable for induction and those discharged from training centers for neuropsychiatric reasons. All of the members of the civilian neuropsychiatric staff of the Induction Center are distressed by the hesitation of some personnel managers to employ these rejectees. In the New York Induction Center 10 to 20% of all applicants are found unacceptable for the Armed Services, for neurological or psychiatric reasons. By far the greater proportion of these men are or may be normally employed. In this regard it should be remembered that an estimated 10% of the population have psychoneuroses. This figure is I believe far too conservative. Collier,[2] in reporting the statistics compiled from the study of the members of a large Industrial Society in England, disclosed that 280 per thousand of all disabled persons, from any cause had experienced unduly prolonged disablement by reason of nervous disorders. This means that 28% of all persons have a background suitable for the development of psychoneurosis should they become ill from any cause.

At the Induction Center we are endeavoring to select men who will be able to undergo the toughest physical work under circumstances of the severest possible emotional strain without bcoming neurological or psychiatric casualties. Individuals who have given evidence of emotional instability in civil life clearly should not be selected. Personality difficulties which might be mildly annoying in civil life assume great importance in situations where immediate and complete cooperation is of utmost necessity. Many minor ailments, of little consequence in civil life, are disqualifying for combat duty. An individual who has experienced a fainting attack should not be allowed to pilot an aeroplane. Slight muscular atrophy resulting from infantile paralysis contracted in childhood, may well be disabling when these muscles are subjected to severe overstrain. Nocturnal enuresis, the result of an occult spina bifida is disqualifying. The Navy must be exceedingly careful in the selection of its personnel as an ill person cannot be quickly replaced or promptly sent to a base hospital.

We consider that the Armed Services have a tremendously difficult job to do, and the successful prosecution of the war cannot be hampered by enrolling predictable casualties. The Army is not a reform school or rehabilitation center for civilians. I am sure that in examining selectees, our evaluation has been faulty in some instances and we have rejected men who would have made good soldiers. We have also misjudged the ability of many to withstand the rigors of training, with the result that they have had to be released from service after undergoing hardships on the part of the trainee and his family, as well as labor and expense on the part of the Army.

In conclusion, I believe that the problems which will arise when our boys come home will be individual situations, which must be met individually, rather than by legislation or other mass measures. We must not assume that the returning soldiers will bring all of the questions to be answered, but realize that in many instances we are the problem he will have to meet. Let us prepare ourselves.

2. Collier, H. E.: Neurotic and Psychiatric States as causes of inability to work in England, 1940-1. *Brit. Med. J.*, October 9, 1943, pp. 461-462.

The Role of a Sanitarian

—In an Industrial Hygiene Program—

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For many years, it has been the custom to think of the Industrial Hygiene Division of the Health Department as consisting of only four types of personnel—the industrial hygiene physician, the industrial hygiene engineer, the industrial hygiene chemist and the industrial hygiene nurse. Of late, other professions, such as nutritionists, dentists, health educators, and medical specialists—ophthalmologists, psychiatrists and others—have been brought into this field. In this paper, we would like to discuss some of the phases of the role of the sanitarian in the industrial hygiene program.

The war has not only brought about a sudden increase in industrial hygiene problems but a limitation in available professional personnel as well. Confronted with the problem of having to do the most with the limitations at hand, several departments have learned to utilize and appreciate the services of the industrial hygiene sanitarian.

In this paper, the term sanitarian is used in a functional sense, and may include either an engineer, or one who has been trained in a science related to sanitation, or an inspector, depending upon individual training, aptitude and application. Also, we would like to point out that the local sanitarian should take an active interest and part in industrial sanitation, with the help and guidance of the personnel of the Industrial Hygiene Division. In failing to do this, the local sanitarian leaves an important gap in his efforts of environmental control.

In the United States, statistics show that 65%[1] of all occupational diseases are due to occupational dermatoses. Actual studies made by the USPHS,[2] in various basic industries, show that more than 1% of all the workers suffer some time during the year with occupational dermatitis. This has been estimated at about 250,000 cases of occupational dermatitis of varying degree of severity occurring yearly in the United States, with a total estimated cost of $4,000,000. Industrial dermatitis is a preventable disease and of all the means of its prevention, cleanliness is of prime importance. In any given type of industry, we find that the incidence of occupational dermatitis bears a direct relationship to the adequacy of washroom facilities. Management must realize that every employee leaving the plant improperly or inadequately washed, represents a definite liability to that company. To meet this liability, management must extend more than a desire or an order that its employees wash

themselves properly. Washrooms, with inadequate number of wash basins, which are often of inferior construction and maintained in an insanitary manner, supplying only cold water, and often with no soap or towels, can not be expected to fulfill the need of the above desire. It is the duty of the sanitarian to properly evaluate washroom facilities in conformance with the minimum acceptable standards and legal requirements and regulations of the state and local health departments, local building and plumbing codes, etc.[3] In addition to supplying management with the minimum acceptable standards, the sanitarian must overcome ignorance and apathy on the part of those in charge of the maintenance of washroom facilities and instill proper personal hygiene education among the employees. Many cases of dermatitis among workers have been caused by the cleansers used by workers before going home; e.g., workers who become soiled with oils, greases and dyes, are likely, if left to themselves, to use the most available and most rapid acting solvent to clean the skin and do not stop to consider the irritant action of the cleanser. Space and time do not permit us to go into detail concerning the minimum acceptable standards,[3] the proper maintenance of washroom facilities, proper industrial cleansers for the normal skin, the sensitive or dry defatted skins, special reinforced cleansers safely to remove dyes or tenacious oils,[4, 5] and the principles of proper personal hygiene education of the employees. In fulfilling his function of investigating the adequacy and proper maintenance of the washrooms, the sanitarian is rendering a preventive measure far more valuable and effective than any protective cream or curative treatment the industrial hygiene physician could recommend for occupational dermatoses. Also, the health habits promoted by the sanitarian at the plant will tend to be transferred to the home and community of which the plant is a part.

THE determination of the adequacy and proper maintenance of toilet facilities in the plant is another important function of the sanitarian. It is not at all uncommon to find in industry, toilet facilities that are not readily accessible, inadequate in the number of facilities and of inferior construction and design, maintained in an unsanitary manner, and lacking toilet paper, proper washing facilities and space. No, the contraction of syphilis and gonorrhea from toilet seats may be rather remote, but the revulsion which results in not using the toilets induced by filthy toilet arrangements, is not remote.[6] Toilets reeking ammoniacal odors of stagnant urine and fecal material are excellent conditioners of chronic constipation.

The war has brought about a large increase of female employees in industry. This has resulted in further emphasizing the need for proper toilet facilities for each sex. For example, a plant in this state, employing some 400 people making nets for the Army had production suddenly interrupted by an epidemic of pediculosis capitis (head lice). Those who had the infestation did not care to come to work, and those who did not have it feared to come lest they might get it. It was interesting to note that even top management had pediculosis capitis. The infestation was introduced into the plant by a new female employee and spread by the use of a common towel in the toilet room. After universal treatment of both management and employees, production was started again that very afternoon. It was unfortunate indeed that this plant had to appreciate the value of the services of the sanitarian and the need of proper toilet facilities in this costly manner.

The problem of proper sanitation for industrial eating facilities, such as plant cafeterias, lunchrooms, box-lunch companies, caterers, and neighborhood cafes and restaurants, is one of the most important duties of the sanitarian.

Very few circumstances cause more disruption of production, absenteeism and lowered employee morale than an outbreak of food poisoning. Often, the cause of the sudden illness occurring among large numbers of employees is not recognized as food poisoning and various rumors attributing the attack to some unknown poisonous gas or fume arising in the plant run rampant. Respiratory infections, in epidemic form, although not publicized as much as food poisoning, have been clearly demonstrated to have been transmitted from person to person, by way of insufficiently cleaned eating utensils. When we realize that common colds and gastro-intestinal diseases are the two leading diseases causing absenteeism, and together account for nearly one-half of all absenteeism caused by disease,[7, 8] we begin fully to appreciate the importance of proper sanitation of industrial food facilities. This program must not only be directed at the plant cafeteria, but, in the case of caterers, to the place of production and point of distribution as well. Attention must also be directed to commercial caterers which include the hot-dog stands, coffee shops, drug stores and poorly maintained cafes and restaurants that feed many workers in the environs of plants. In addition to sanitary inspection, the industrial hygiene sanitarian conducts special courses for food handlers in plant cafeterias; emphasizing proper methods of simplification and improvement of food handling practices and equipment. Cafeteria sanitation extends beyond the protective function in the cafeteria kitchen. In the dining room, cleanliness, orderliness and pleasant surroundings encourage the worker to eat and benefit from his food.[4] With the guidance and help of the industrial nutritionist and industrial hygiene physician, the sanitarian has considerable information relative to industrial nutrition, promotional and educational methods for both management and employees in order to achieve better meal planning and better eating habits.

THE careful evaluation of facilities and maintenance of the locker, dressing and rest rooms for both male and female employees is another important duty of the sanitarian. Many plants have no provision for such facilities and far too many have dressing and rest rooms inadequate as to size and construction; and lockers that are too small, of poor construction, and not maintained in a sanitary or hygienic manner. The storage of oil-soaked rags and work clothes in wooden lockers inviting the danger of spontaneous combustion, the pernicious habit of keeping spoiled food and garbage in these facilities, inviting pests in the form of ants, cockroaches and rats, as well as the danger of food poisoning resulting from lunches which require refrigeration for their storage, are but a few of the many problems confronting the sanitarian in this field.

The need for adequate numbers of couches or beds in properly screened rest rooms, especially in small plants which do not have any medical or first-aid rooms, is made more imperative with the large increase of women in our industrial population. Female employees suddenly overcome by syncope, vertigo, or discomforts of menstrual irregularities can hardly be expected to be treated adequately where such facilities are lacking. Such circumstances constitute not only hardship for the disabled employee who cannot

obtain adequate comfort and relief at the plant, necessitating loss of time by having to leave the plant in a debilitated state, but also cause loss of production, by the confusion among the other employees. For all employees exposed to injurious dusts, fumes and gases, many state labor and industrial laws require adequate lavatories and dressing rooms, the latter being furnished with compartment lockers so that the ordinary street clothes of such employees shall be kept separate and apart from the working clothes. The promotion by the sanitarian of various arrangements for plant laundry service of work clothes and, in some cases, the provision of plant work clothes as well, goes far in helping to reduce the harmful effects of toxic dusts, fumes, oils, etc., as well as improving general sanitation in the plant.

THE survey of the water supply and drinking facilities in industry by the sanitarian is a matter of prime importance. All places of employment should provide a readily accessible supply of clean, cool, wholesale and safe drinking water. However, too often we find the common cup, open containers, and an inadequate number and unapproved types of drinking fountains in industry. We shall not go into the details of the ordinance and code regulating eating and drinking establishments, issued by the USPHS in March, 1938, and the industrial sanitation standards of state and local health departments. However we would like to emphasize the duty of the sanitarian, where water is taken from an unapproved source to be used for industrial processes or fire protection, to see that notices are posted stating that this water is unsafe and should not be used for drinking, and he should make special effort to prevent its being so used. It is his duty to ascertain that no cross-connection or improperly protected cross-connections—if same are allowed by health regulations—exist between a system furnishing water for drinking purposes and an unsafe water system for other uses. Also, he should check all plumbing for any possibility of back-siphonage. Containers from which water is dipped or poured for drinking purposes are often seen on construction jobs or where workers are engaged at some distance from the plant. The sanitarian should discourage their use, and recommend in its place a pump-type portable drinking fountain, which should be refilled only at stipulated sources which are known to be safe. In the effort to combat heat cramps, heat exhaustion and even heat stroke, the sanitarian renders valuable preventive treatment in recommending adequate supplies of salt tablets at the drinking fountains, not only in industries offering this exposure but also in others during the warm summer months. Last year, 400 employees at a Virginia textile mill were hospitalized because of a sudden outbreak of heat cramps during a hot spell. On account of the sudden onset, the large number of employees involved, and bizarre types of symptoms, all sorts of possibilities such as food poisoning, poison gas and even sabotage were suspected. Production was completely stopped, until it was found that the trouble was heat cramps.

In those plants which have no industrial physician or nurse, the sanitarian performs a distinct preventive service in the effort to reduce disability due to accidents by recommending that some one employee or a group of employees for each shift be designated to complete a standard first-aid course, as that offered by the Red Cross. The sanitarian inspects all first-aid kits to ascertain whether they are complete, maintained in a sanitary manner and, above all, if they contain any harmful drugs, or narcotics. Many first-aid personnel have been found to have first-aid kits which included a complete assortment of surgical instruments, in some cases enough to furnish a modern minor surgical dispensary. This practice is to be discouraged because the placing of these materials in the hands of non-professional personnel can only lead to harm. The sanitarian recommends the use of standing orders for all first-aiders from their respective physicians on call, and offers a sample set of such orders which can be modified in whatever way the on-call physician and first-aider may desire. The maintenance of proper first-aid records is a vital duty of every first-aid department. The sanitarian evaluates these records and offers sample sets of daily first-aid logs and monthly recapitulation forms classifying all first-aid cases as to department and types of cases, etc., which information could be used to good advantage by the safety director of that plant.

THE sanitarian plays an important role in adult health education. As mentioned above, he is concerned with proper personal hygiene education for the proper care of the skin; in food handling courses for the prevention of food poisoning and respiratory diseases; nutrition—not only as to the requirements of a complete diet, but types of food that keep well and most nutritious for the packed lunch; salt tablets for the prevention of heat cramps and heat exhaustion; first aid training—in order to reduce disability due to accidents. He also assists in the distribution of adult health education literature on such topics as venereal disease, proper dental care, proper care of the eyes, tuberculosis control, etc. In this work he utilizes the various educational material (i.e., pamphlets, posters, sound slide films and sound motion pictures) as prepared by the USPHS; state and local health departments, U. S. Department of Labor, Safety Council, and all other agencies.

The problem of proper disposal of industrial wastes constitutes an important phase of coordination between industrial and community health services because of the possibility of untreated industrial wastes polluting streams and bodies of water, overloading sewage treatment stations, or producing tastes and odors in public drinking supplies. In this field the sanitarian works in close coordination with the other members of the health department.

The sanitarian's careful evaluation of good housekeeping throughout plants is desirable from a production as well as an accident prevention and health point of view. The details of the various state and local health codes on standards for proper housekeeping are not within the scope of this paper, but we would like to emphasize that where occupational exposures involving toxic dust or fumes are concerned, good housekeeping is of special importance. Not only should floors and workbenches be cleaned of injurious dust accumulation but overhead structural supports as well should be given periodic cleaning. The method of cleaning non-toxic as well as toxic substances should not introduce additional exposures either to the sweeper or to the men at work. Wet sweeping, vacuum cleaning, removal of dust accumulation after hours of work, are practical recommendations and used in many plants. Control of ants, roaches, flies, fleas, rats, and other pests, as well as the proper storage of toxic materials, such as cyanides with acid, and inflammable materials, are but a few of the many problems related to good housekeeping that have required the attention of the sanitarian.

Proper illumination is essential for good vision, safety of employees, and maximum production. With-

out good lighting, eyestrain, headaches, and fatigue occur, spoilage of materials increases and production decreases. It has been estimated[7] that poor illumination constitutes approximately 25% of the causes of industrial accidents.

The sanitarian, with the aid of the foot-candle meter, renders much assistance in surveying plants for adequacy of illumination for various types of work. Not only are proper intensities important for the particular type of work, but in addition, attention must be given to the avoidance of glare and of too sharp differences in illumination levels between adjacent areas. Acceptable standards for levels of illumination have been worked out by the Illuminating Engineering Society and the American Standards Association, as well as the USPHS.[3]

In the fields of noise control, ventilation and air conditioning, the sanitarian must depend more heavily on the industrial hygiene engineer for guidance. In noise control, the sanitarian can recommend personal protective devices, but must leave methods of noise control by elimination of noise at its source, as well as reduction of noise by altering the surroundings, to the industrial hygiene engineer and experts in this field. In matters of ventilation, the sanitarian can survey plants in regard to their natural ventilation and take dry and wet bulb temperatures and compare these with the standards of the USPHS[3] and the American Society of Heating and Ventilating Engineers.[10] However, this field requires the services of a skilled engineer properly to evaluate the problem so that proper facilities may be provided.

The sanitarian in his routine survey through plants, makes a record of all materials and operations that represent potential health hazards. This information is then passed on to the industrial hygiene physician and industrial hygiene engineer, for estimation of the severity of the hazard. In this function, the sanitarian acts as a screening agent and enables the industrial hygiene physician and industrial hygiene engineer to spend more time where hazards have been already suspected.

IN CONCLUSION, we would like to make note of a strong movement toward the recognition of industrial sanitation as a prime ingredient in industrial operations.[6] This movement sponsored by Solworth, of Louisville, advances the concept of controlled sanitation, which embraces the five functions of prevention, correction, protection, esthetics and hygiene. A year's intensive training is being planned for industrial sanitarians, including subjects such as bacteriology and chemistry of cleaning, soaps, detergents, wetting agents, materials, engineering studies, time-motion projects, architecture, landscaping, industrial decoration, personnel management, personnel coordination, teaching methods, statistics and records, cost control, and safety, all specifically treated with respect to industrial sanitation.

It will be interesting and valuable for the sanitarian to join in the progress of this project and utilize this information in the field of industrial hygiene sanitation.

To the industrial hygiene administrator, we would like to recommend serious consideration of the many useful ways in which the sanitarian can aid in this field.

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Methyl Chloride Intoxication

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FORMERLY when freon, dichloro difluoro methane, was generally used as the refrigerant of choice in most types of refrigeration and air conditioning, accidents and undesirable reactions due to contact with refrigeration gases were seldom if ever encountered. This is the reason that it is still widely believed that all refrigeration gases may be innocuous. Military requirements for freon made this gas little available for civilian use. From a mechanical point of view the only substitute for freon, now available, is methyl chloride, which gas is used with increasing frequency for refrigeration and air conditioning purposes.

As the latter gas possesses definite toxic properties, it seems wise and important to warn repairers and users of units in which it is employed that exposure should be avoided. That this is necessary is proved by the case of chief engineer H. to be described here. Substituting freon with propane instead of with methyl chloride should be considered.[1] It could be recommended to add, as admixture to methyl chloride, acrolein, as detecting agent.[2]

Most of the comparatively few publications about methyl chloride intoxication deal with symptomatology and treatment of acute poisoning. Little can be found in the medical literature about chronic intoxication due to repeated short exposures to smaller concentrations. Barritt, Yaglou and McCord[3] already state that repeated exposures at intervals such as one week apart may lead to cumulative damage. They believe that concentrations of over 50 p.p.m. are probably undesirable in sustained exposures. This is in accordance with animal experiments. As early as 1929, Kegel, McNally and Pope[4] described methyl chloride poisoning from domestic refrigerators.

It appears from the literature that symptoms of acute methyl chloride intoxication are dramatic and, as they occur only in cases where exposure is evident, their nature will not be readily overlooked. The Bureau of Mines[5] noted, as physiological response attending exposures to vapours of methyl bromide, methyl chloride, etc., that symptoms of acute intoxication were chiefly of anesthetic character: excitement, rapid loss of equilibrium, inability to walk, involuntary movements of the legs. McNally[6] mentions severe headache, nausea, vomiting and abdominal pain, mental and psychomotor disturbances, with a rise in pulse rate, temperature and respiration rate. Death, usually preceded by profound cyanosis, is caused by respiratory paralysis. An amnesia is frequently present. McNally also describes anuria and acidosis.

Symptoms of chronic poisoning as listed by the

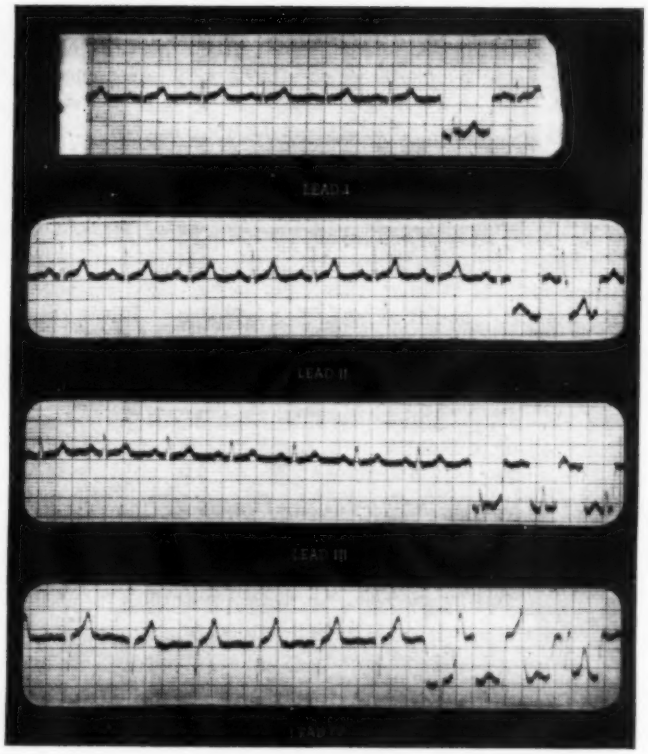
Bureau of Mines[5] consist mainly of a profound asthenia with rapid pulse, convulsive rapid respiration, with rales, and in some cases frothy (often blood-tinged) exudate from the nostrils. The editor of the *Journal of the American Medical Association*[7] compares the symptoms of methyl chloride intoxication to those of methyl alcohol intoxication if the patient escapes or survives asphyxiation. He states that methyl chloride is decomposed in the body into methyl alcohol and hydrochloric acid. The latter substance combines with mineral salts, to form sodium and potassium salts, which of course do not contribute to the general poisoning. The chief points of injury are likely to be the kidneys, the liver and the central nervous system, including the optic nerves.

It appears that symptoms of acute intoxication are mainly those of asphyxiation and shock with irritation and later depression of the central nervous system, accompanied by acidosis and disturbance of the function of liver and kidneys. It would therefore seem wise to direct therapy upon these groups of disturbances. Oxygen therapy will be of primary importance and should be administered without delay, even in the ambulance en route to a hospital. If restlessness and confusion make such desirable, phenobarbital should be given parenterally.

To combat the acidosis and at the same time to stimulate kidneys and liver functions, dextrose 20%, 1/6 molar solution of sodium lactate and blood plasma should be administered by intravenous drip. When it becomes necessary to stimulate a depressed central nervous system notwithstanding the fact that oxygen had been given, coramin and lobelin should be the medicaments of choice.

In cases of chronic intoxication with methyl chloride the symptoms are mainly those of degeneration of parts of the nervous system, and hence therapy should consist of rest and later carefully planned and supervised occupational and other physical therapy. It stands to reason that ultimate recuperation is benefited by a diet rich in proteins, vitamins and minerals and in such additional vitamin preparations, e.g., thiamin, as would seem appropriate.

As it is now generally known that most cases of ethyl and methyl alcohol poisoning are beneficially influenced by huge doses of thiamin administered parenterally, it would seem wise to try this vitamin also in methyl chloride intoxication.

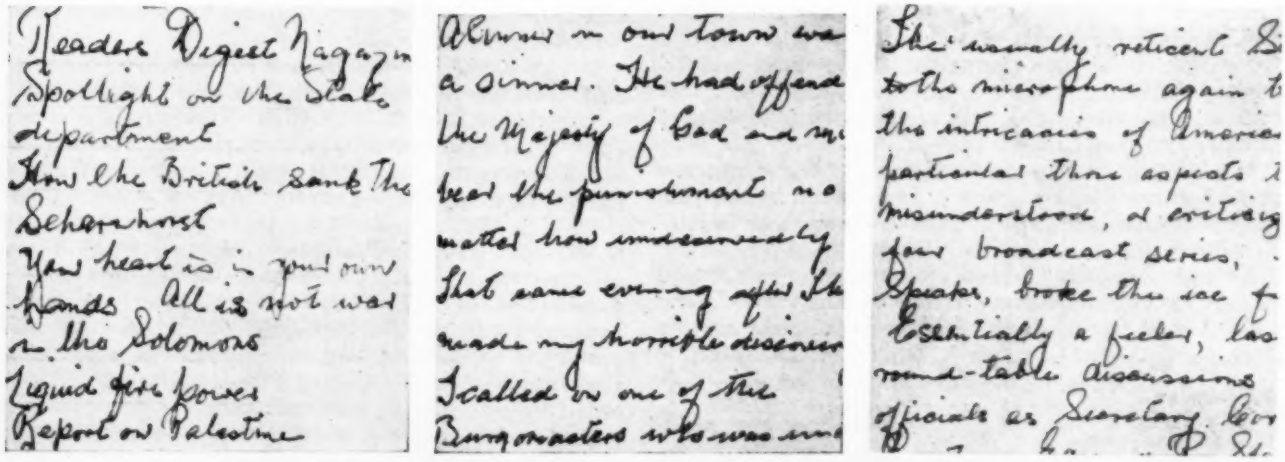


Electrocardiogram

THE case which leads to this publication is the following:

January 28, 1945, the chief engineer of a tanker consulted our port medical officer. Two weeks previously a repair job on the refrigeration plant aboard had been done. The engineers and assistants who did the actual work had been provided with respirators, but the chief engineer who only occasionally controlled the work had not been protected and so had been exposed off and on to small amounts of methylchloride. For the last 10 days he had felt increasingly fatigued, so much so that he could hardly stand upright and walk. His gait was staggering, he could not lift up his feet. There was a marked giddiness. There was loss of strength of all muscles. There were muscular twitchings in arms and legs. The vision was blurred and the eyesight was so much impaired that he could neither read nor write. There was no diplopia. There had been no real pains, especially not in the abdomen. There was a marked anorexia. A week ago patient had been very nauseated and vomited several times. He had lost weight from 147 to 124 lbs.

There were no palpitations, no dyspnea and no cyanosis.


Reader Digest Nagazin
Spotlight on the State department
How the British Sank The Scharnhorst
Your heart is in your own hands All is not vain in the Solomons
Liquid fire powers
Report on Palestine
A man in our town was a sinner. He had offend the Majesty of God and re bear the punishment no matter how undeservedly That same evening after the reader my horrible dreamer I called on one of the Burgomasters who was
The usually reticent S to the press threw again t the intricacies of Americ particular three aspects i misunderstood, a critica four broadcast series, Speaker, broke the ice f Essentially a frolic, las round-table discussions officials as Secretary Co

Handwriting: February 2—February 8—February 26

In the beginning patient had suffered from severe headache. The memory was disturbed. It was not evident if patient during this time ever lost his consciousness. His mood was depressed, the sleep was disturbed, there was insomnia at night and drowsiness during the daytime. There were paresthesias in arms and legs.

Patient had not noticed that his facial expression had changed; from a photograph however the change was evident.

In the first World War, patient was twice gassed by the Germans, presumably with chlorine.

On physical examination we found a very tired, weak and nervous man who evidently had lost weight.

The temperature was 36.4 C, pulse rate 84 p.m., regular and equal. Blood pressure was 125/78.

The skin was pale and moist, no cyanosis. The facial expression was not firm, the mouth being slightly open. The lower eyelids dropped somewhat. The nasolabial folds had almost vanished.

Physical examination did not reveal any abnormalities in heart or lungs. The liver was not palpable.

Our consulting neurologist, Dr. Willem W. de Regt, reported the following neurological findings:

The whole facial musculature was hypotonic. The voice was tired and muffled, the articulation was not clear.

The resistance against passive movements was decreased, the spontaneous motility and the muscular strength were decreased.

The triceps tendon jerk, the biceps tendon jerk and the radius periostial jerk were higher than normal. There were myokymias and tremor of hands. The handwriting was disturbed.

Elevation of the trunk was very difficult.

The abdominal muscular reflexes were high.

Diadokokinesia was disturbed in hands and feet. The patellar reflexes as well as the ankle jerks were high. The knee-heel test and Romberg's phenomenon were ataxic. The gait was highly ataxic.

LABORATORY EXAMINATION:

Urinalysis: albumin, reduction, urobilin, urobilinogen and acetone were absent. The sediment contained only calcium carbonate crystals.

Blood: Hemoglobin, 11.4 gm. %; R.B.C. 4,320,000, Index 0.80; W.B.C. 7,250, of which were: eosinophils 7%, stabs 9%, polymorphonucleates 46%, lymphocytes 34%, monocytes 4%. Sedimentation rate of the R.B.C. (Westergren) in one and two hours, respectively: five and 13 mm.

Wassermann and Kahn reactions: negative.

Basal Metabolism: +30%

Electrocardiogram: P-R internal 0.18"; QRS 0.06". No electrical axis deviation. There were no abnormalities in any of the four usual leads, but the voltage was low.

Therapy consisted of rest in bed, diet rich in protein and vitamins and daily intravenous injections of thiamin.

January 31 the condition was much improved, especially the muscular strength. There was considerably less tremor. The appetite was better.

February 2 patient thought he was able to write. The samples of his handwriting demonstrate clearly the initial disturbance and the improvement after a few weeks. The last sample was February 26.

On the latter date there were no more neurological abnormalities and a few days later the patient was able to join a ship as acting chief engineer.

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The Use of Aluminum in Silicosis Control

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THE etiology of silicosis having been established for many years as due to inhalation of free silica (SiO_2), measures of prevention have chiefly been of engineering nature in order to reduce atmospheric silica dust concentrations in industry below the level of five million particles per cubic foot of air. Standard protective practice also includes repeated observation by chest x-ray, at least on an annual basis, of those workers exposed to potentially harmful concentrations of this dust. In 1937 the inhalation of pulverized metallic aluminum was reported to prevent silicosis in experimental animals by Denny, Robson and Irwin,[1,2] and since that time the work has further expanded. Currently aluminum is being introduced on an industry-wide basis as an auxiliary means for control of the silicosis hazard. As a corollary the originators of aluminum prophylaxis have treated individuals disabled by silicosis and have obtained excellent clinical results.

The pathology of silicosis has been described by several investigators notably Gardner,[3,4] but while the tissue response is fairly constant, the symptomatology associated with the characteristic roentgenologic findings has been rather uncertain. Individuals with far advanced roentgenologic changes may show no symptomatology while others with relatively minor changes by x-ray may be severely disabled. Functional tests for pulmonary disability are uncertain of interpretation due to the wide variation in the normal, and for that reason the disability produced by silicosis has been almost entirely a subjective phenomenon with few objective signs.[5] The use of aluminum as a therapeutic agent has apparently remarkably improved a number of silicotic individuals. This finding tends to corroborate the usefulness of aluminum as a specific agent against silicosis. Up to the present inhaled aluminum is the only medication known to give significant relief from the symptoms of silicosis.

It is considered worth while at this time to review and analyze the use of aluminum in the control of silicosis as its application in industry is rapidly becoming widespread. The data contained in this paper were gathered by personal interview and observations at various centers in the United States where aluminum is in use as either a prophylactic or therapeutic agent, or both.

Principles

IT HAS been established by animal experimentation for both finely divided metallic aluminum and amorphous hydrated alumina that:

1. If alumina* and quartz (silica) localize in the

By special arrangement with the *Journal of the Medical Association of the State of Alabama*, this article is appearing simultaneously in the September issue of both that Journal and this one.

same cell the effect of the quartz is neutralized.

2. Further progression of silicotic pathology (tissue reaction) is arrested by this phenomenon.

3. Mature silicotic lesions (nodules) become static and immature lesions (inflammatory and early fibrous changes) are resolved.

4. The presence of aluminum does not alter the distribution of quartz in the tissues.

5. The effect of aluminum after inhalation is prolonged (a single large dose may remain in the tissues for over a year).

6. The presence of aluminum in the tissues produces no toxic effects in healthy animals with this one possible exception—that experimentally it has been shown that hydrated alumina in large doses may alter the body defenses against tuberculosis.

Aluminum and its compounds are not toxic substances and may safely be used in humans. Allergy to the metal may occur occasionally in an idiosyncratic individual.[6] The Canadian investigators using metallic aluminum have seen no untoward effects in any of their animal or human experiments. Crombie[7] exposed silicotics with pulmonary tuberculosis to the same kind and doses of metallic aluminum as used in uncomplicated silicosis without producing any change in the tuberculosis. Gardner, using hydrated alumina in animals, found that small doses adequate to protect against silicosis did not seem to increase the susceptibility to infection. However, when animals were injected with large doses of the compound progression of new tuberculous infections occurred.[8] These doses of hydrated alumina were so massive as to produce atrophy of the spleen and its untoward effect may have been due to overloading of the phagocytic mechanisms of the body. It would seem wise in view of this finding to exercise care in selecting cases for use with aluminum treatment or prophylaxis since as yet there is not enough clinical data to refute this experimental evidence of possible harm.

The original Canadian investigators used metallic aluminum as the antidotal agent against silica dust. Gardner in his experimentations found that amorphous hydrated alumina was also successful in neutralizing quartz. Only one of these hydrated aluminas, XH-1010, at present produced by the Aluminum Company of America for experimental purposes only, has proved to be effective. Gardner prefers the use of this material pointing out that:

1. It is probably the substance ultimately produced as the inhibitory agent.

2. It is stable and hence simpler to use than freshly ground aluminum which requires a continuously-operating ball mill.

3. It is easier to disperse in the air for dusting groups.

4. It has less tendency to flocculate on contact with moisture and body fluids.

5. Its white color makes it less objectionable than the black metallic aluminum.

In view of the longer experience of the Canadian groups with metallic aluminum they insist on its use. They state that the metallic aluminum is a better substance to use than amorphous hydrated alumina as it has proved its value in animal and human experiments. Metallic aluminum powder consists of a nucleus of metal surrounded by an oxide. The metallic content varies from 20 to 33%, the remainder being oxide. In the body this oxide hydrates to an active complex hydrated alumina, which coats the silica particle. The metal further oxidizes and then hydrates to become a complex hydrated alumina. For every unit of metal there are 2.7 units of the hydrated alumina produced, in other words, the metal acts as a reservoir for the inhibitory agent. Furthermore, it is felt that the tendency to flocculate has no importance when the material is inhaled and that such small amounts are used that the black color of the finely ground aluminum is not an objectionable feature. Both compounds have been shown to be equally effective by Bamberger[8] who treated two groups of silicotics with each of the agents. It would appear, therefore, that the choice of either agent is chiefly a matter of personal preference. It should be mentioned that at this time only metallic aluminum is available for therapy and prophylaxis under licensing arrangements.

[6]Unless otherwise stated refers to both freshly ground metallic aluminum and amorphous hydrated alumina.

Therapy

SINCE animal experimentation has proved that aluminum is effective in preventing silicosis corroborative evidence has been accumulating in that silicotics with disability have improved with aluminum therapy. The most recent tabulated data is found in a paper by Hannon who reports that out of 143 workmen with positive x-ray and disability 135 were improved, and that 93 out of 104 workers with positive x-ray but denying disability also improved.[9] These findings have been substantiated by several other investigators who treated silicotics who developed the disease while employed in the ceramic industry and in foundries. Gardner,[10] treating a small group of iron ore miners with silicosis, did not obtain the dramatic improvement reported by others but does report that a number showed subjective improvement. There is still controversy regarding objective evidence of this improvement. Pulmonary function tests are difficult to interpret and those clinicians using the rigid criteria of objective findings find improvement less remarkable.

Hannon[11] feels that aluminum is effective in relieving the bronchospasm which he believes is responsible for much of the pulmonary dysfunction in silicosis. He also believes that most silicotics even without emphysema or tuberculosis have disability and that death from silicosis may occur without cardiac or tuberculous involvement. He states that physiologic tests, especially of pulmonary ventilation, corroborate these findings. The individuals considered least suitable for treatment were the ones with advanced emphysema or tuberculosis. From the pathological standpoint Hannon believes, as does Irwin, that the dyspnea of silicosis is due to thickening of alveolar walls interfering with gaseous exchange and that aluminum causes recession of these findings and improved respiratory interchange. However, no regressive changes have been demonstrated by x-ray, and as yet only one autopsy has been obtained on a worker who was insufficiently treated with aluminum and whose pathological findings were inconclusive.

Another advantage of using aluminum in an industry with a silicosis hazard is that it apparently improves the relations between labor and management. Workers who suspect that they may have silicosis often refuse to be x-rayed since discovery of the condition may lead to dismissal or transfer from the job for which they are best fitted. This is especially true where engineering control of the dust is delayed or inadequate. By treating such an individual with aluminum the worker may continue on his job in a potentially hazardous silica environment without danger to himself. Hence, by removing this fear of transfer or dismissal an aluminum program alleviates one of the critical points of difference between labor and management in relation to industrial health. In addition, the

introduction of an aluminum program makes the desirability of pre-placement and periodic physical and x-ray examinations more reasonable to the working force.

Such programs have numerous other benefits both to labor and to management.

The therapeutic use of aluminum is worthy of extensive clinical application. Analysis of Hannon's cases leaves no doubt that most disabled silicotics, at least in the ceramic and foundry industries, are improved in that they have less dyspnea, decreased cough, and decreased chest pain.

This is confirmed by the experiences of a number of plant physicians.

Prophylaxis

AT THE present time all data on the efficacy of aluminum as a perventive measure has been on the basis of animal experimentation. The evidence, however, is so consistent that there is every reason to believe that it will be efficacious in humans also. To determine its efficacy in humans, however, will require a number of years since silicosis does not appear on the average until 10 years of exposure to harmful concentrations of silica dust. In many parts of the world workmen are being treated prophylactically and it was stated that in five different plants where engineering control was impossible workers are being treated prophylactically while still being exposed to concentrations of silica known to produce the disease in relatively short periods of time. In a few years when this data is available the use of aluminum as a preventive measure may be more urgently recommended.

The use of engineering methods is the recommended measure of silicosis prevention since dust control has the additional advantages of:

1. Providing a cleaner work place and thereby increasing efficiency and morale.

2. Removing from the worker's mind the psychological effect of being constantly exposed to a health hazard.

3. Diminishing the burden of the protective mechanisms of the lungs in handling extraneous inhaled material.

4. Reducing the possibility of legal action arising as the result of exposure to dust.

McIntyre Research Limited, the United States organization created to license the use of aluminum as a therapeutic and prophylactic agent, insists on dust control measures, as do all other industrial hygienists.

Discussion

THERE are some differences of opinion among industrial hygienists as to the proper use of aluminum as a therapeutic and prophylactic agent. Our observations and experience have led us to the formulation of a number of indications for the use of this agent. This program could be very readily fitted into the basic procedures used in the control of a silicosis hazard. These practices usually consist of three phases:

1. Analysis of environmental dust exposure, including such factors as atmospheric concentrations, size of particles, and type of dust.

2. Engineering methods designed to reduce dustiness below a concentration of five million particles of pure silica per cubic foot of air.

3. Medical study by history, physical examination, and x-ray of exposed workers by means of a preplacement and periodic examination.

Certain workers should be selected for further protection by aluminum using the following criteria:

A. Aluminum should be used therapeutically:

(1) In those individuals who are diagnosed as suffering from silicosis and who are still exposed to some silica dust. It would also be advisable to treat all silicotics who have been exposed to silica in the last 10 years in order to arrest possible progression.

(2) In those individuals who have silicosis with disability and who have no evidence of other pulmonary diseases especially tuberculosis. Under very rigid conditions of observation and control silicotics with apparent inactive tuberculosis may be treated.

(3) In those workers who show silicotic changes in environments where their fellow workers do not show any evidence of the disease. These individuals apparently have a precocious tendency and for them treatment may be advisable. Frequently these workers are diagnosed as pre-silicotics on the basis of increased linear markings in the chest x-ray without definite evidence of nodulation.

B. Aluminum should be used prophylactically:

In those workers exposed to a hazardous silica environment where engineering control is impossible or impractical at the time. To fully evaluate the protective action of aluminum, pre-placement examination and periodic examinations coupled with a careful history, physical examination, and physiological test for pulmonary function should be used.

C. Contra-indications:

Individuals with evidence of active tuberculosis should not be treated nor should workers with other pulmonary ailments or far advanced cardiac diseases.

D. Factors necessary for a proper program of aluminum therapy and prophylaxis:

(1) The use of aluminum should be in charge of a qualified physician.

(2) Initial and periodic x-ray and physical examinations should be made to determine the need for treatment, response under treatment, and progression or regression of the disease.

(3) The environment should be controlled by engineering methods to prevent excessive exposure to silica dust.

Conclusions

THE wide-spread use of aluminum as a therapeutic agent should be encouraged if strictly controlled by means of medical observations.

2. Aluminum therapy should also be used in a limited number of silicotics without disability such as those still, or recently exposed to silica dust and individuals with a precocious susceptibility to the disease.

3. As a prophylactic agent aluminum should be considered only as an adjuvant to engineering control.

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The American Association of Industrial Physicians and Surgeons

—Annual Meeting—

THE annual meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS was held on June 22, 1945, in the Association offices in Chicago, in line with the notice of meeting and proxies sent to all members 30 days prior to that date. As stated in the notice, holding this meeting by proxy enabled the business of the Association to be carried on and officers to be elected in accordance with the corporation laws of the State of Illinois governing the Association, while, at the same time, it complied with the ruling of the Office of Defense Transportation.

Melvin N. Newquist, M.D.

Four hundred and thirty-nine proxies were returned from members in 41 states, and there were also returns from members in Canada, Hawaii and Curacao, as well as several from members in military service who are at present in the South Pacific and in Europe. The Board of Directors were well pleased at the interest shown in the affairs of the Association, as evidenced by the returned proxies. New officers and Directors as elected through the mail ballot are: MELVIN N. NEWQUIST, M.D., President; LOYAL A. SHOUDY, M.D., President-Elect; HENRY S. BROWN, M.D., First Vice-President; HAROLD A. VONACHEN, M.D., Second Vice-President; FREDERICK W. SLOBE, M.D., Secretary; EDWARD C. HOLMBLAD, M.D., Treasurer and Managing Director; Directors: for the period 1944-1946, DRS. HARVEY BARTLE, E. A. IRVIN, R. F. KURZ, F. E. POOLE, RICHARD P. BELL, and A. H. WHITTAKER, and for the period 1945-1947, DRS. F. G. BARR, J. NEWTON SHIRLEY, JAMES M. CARLISLE, A. GIRARD CRANCH, EDWARD P. HELLER and A. L. BROOKS.

The new By-Laws were adopted as published in the May, 1945, issue of INDUSTRIAL MEDICINE; it was voted to create a Trust to be known as the "American Foundation of Occupational Health," to enable the Association to set up opportunities for undergraduate and post-graduate training in the specialty of industrial medicine and surgery, and it was also voted that the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS make the first contribution to this Trust, in the amount of $500.00.

DR. FREDERICK W. SLOBE, after presiding at the annual meeting, introduced DR. MELVIN N. NEWQUIST, elected to serve as President for the years 1945-1946.

DR. NEWQUIST then spoke as follows to the Board of Directors: "I greatly appreciate this honor which has been bestowed upon me. I want you to realize, too, that I accept this honor with feelings of both pleasure and humility. I am sure that I express the sense of this group, the Board of Directors and the Association as a whole, when we convey our sincere thanks to DR. SLOBE for his able leadership during the past year. No one knows except those who have been serving on committees and in similar capacities the great amount of work that is connected with an office such as he has just completed. We all naturally would like to have seen him terminate his office at our annual meeting so that we could have had the benefit of his able chairmanship, and so that he could have had the pleasure of concluding his term of service at an annual meeting. We hope, DR. SLOBE, that we can continue to draw on your wise counsel as secretary during the coming year—don't forget that we will certainly call on you.

"Our organization is getting larger each year, and it would be impossible to conduct the affairs of this Association without the able and efficient service our Managing Director has been rendering. I wouldn't doubt but that as time goes by we may even have to add to our staff in the headquarters office when we obtain funds to carry on such work. Naturally we will have to do this if we are going to accomplish some of the objectives we have in mind.

"I am going to reiterate briefly here some of our objectives, which have been outlined many times before; the establishment of a certification board, which we have been working on for some time; and the setting up of opportunities for post-graduate training, so that we can really point to this field of endeavor as a specialty.

"That is already under way, and it comes particularly under the Committee on Medical Education, and our Committee on Graduate Fellowships.

"It is going to be necessary as we go along each year to concentrate on one or two major efforts, carrying the others along as best we can. We will hit hard, perhaps, at one thing only for one or two years and try to do a good job of the particular things we tackle. I think one of the fine accomplishments of this organization was when we acted to cooperate with organizations with similar interests to make our annual meeting a joint endeavor — groups like the AMERICAN INDUSTRIAL HYGIENE ASSOCIATION, the NATIONAL CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS, the AMERICAN ASSOCIATION OF INDUSTRIAL NURSES and the AMERICAN ASSOCIATION OF INDUSTRIAL DENTISTS. We should continue to strive to make these annual conventions the finest week of education in industrial health in the United States. I think we can do that. I think that we will continue growing. We sometimes wonder what we have accomplished. I personally feel that these joint meetings constitute a great step that has been made, largely as a result of the efforts of this Association.

"We will go ahead and form the American Foundation of Occupational Health. I believe we are going to get funds for it.

"With respect to the committees as a whole, it is my personal opinion that we should not change the membership of those committees that are functioning properly and have a grasp of the situation. We will rotate some of the members to give them an education. We mentioned earlier today the advisability of a Committee on Workmen's Compensation, which I think we should appoint.

"One other thing — about a month ago the American Petroleum Institute organized a medical advisory committee, consisting largely of the medical directors of the various major oil companies and some of the smaller companies as well. We met in St. Louis, with about 12 or 14 of the doctors at this meeting, plus

L. A. Shoudy, M.D. H. S. Brown, M.D. H. A. Vonachen, M.D. F. W. Slobe, M.D. E. C. Holmblad, M.D.

Officers, 1945-1946
AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS

our chemists and technical advisers, so we had a group of probably 40 people. We hope to be able to carry on medical research on medical problems that are peculiar to our industry, and to have some real contributions that will not only be helpful to our industry but will also be helpful to the medical profession as a whole, and helpful to humanity. We think we are going to arrive at some findings that will contribute to the store of knowledge of medical information. The doctors who were there thought it would be a fine thing if the doctors in the petroleum industry could get together and discuss their mutual problems for their own benefit as well as to get together to know each other better personally, and they asked me to see if it would be possible for the petroleum physicians to become associated with this Association. We thought we could organize as an association, and meet one of the early days of the week during the annual gatherings. We might have a half day for a prepared scientific program of problems that are bothering us; and the other half day we could let the respective companies break up into groups of their own doctors to discuss their own company problems.

"There is a point here that I think we shouldn't miss. Such groups in the various industries—petroleum, steel, and all the others—could well form these specialized groups, getting their main doctors together once a year for a meeting that pertains to their own company work, and I think it would be a splendid idea to meet at the time of the AMERICAN ASSOCIATION meeting. We think it would be of mutual help to both organizations if we can get all the other groups to do that.

"That is all I have to say at this time. I certainly want to thank you again for this honor. I am going to try to do my best to accomplish the aims of this Association in keeping with their high tradition and real objectives."

The new Committees appointed by PRESIDENT NEWQUIST are listed on page 8.

New Type of Industrial Health Program

LOUIS W. SPOLYAR, M.D.,
Director, Division of Industrial Hygiene,
Indiana State Board of Health

IN LIEU of the annual two-day intensive postgraduate course on industrial medicine, the Committee on Industrial Health of the Indiana State Medical Association, in cooperation with this Division, suggested that continued educational programs can be realized through local county or district medical society activities. Plans called for one or two county or district level meetings a year on industrial medicine. Thus far the counties participating in this program have reported favorable attendance by physicians on the so-called local level type of medical society meetings. Usually these meetings were held in a hotel or hospital, and the speakers would try to create the industrial atmosphere through any medium at their command—exhibits, slides, photographs or motion pictures. This, as most audiences and speakers know, is a difficult task. This difficulty was beautifully solved by the Grant County Medical Society when they decided to have their industrial medical program in a local plant. Thus an in-plant medical society type of meeting was developed by a progressive County Medical Society, a very receptive and cooperative plant and the State Board of Health. Alec Turner, Manager of the Owens-Illinois Glass Company, Gas City, invited the Grant County Medical Society to have the industrial meeting of the society in the Owens-Illinois plant. Following a dinner, the physicians toured the plant and actually saw all operations and control measures used. After the tour an informal discussion on industrial health problems was held. In a round-table fashion practically all phases of industrial health were covered. The physicians asked management questions; management asked physicians questions, and each in turn peppered questions to the author on legislation and occupational diseases. It was a live, dynamic meeting and profitable to all. The physicians were intensely interested in this on-the-spot, industrial environment type of program. It was instructive to physicians for these workers are their private patients. One physician remarked, "Until tonight I had no clear cut idea what my patients were talking about when they told me they had a certain job to do or that they were exposed to this or that material. Now I think I know." He does! In the future these physicians, through their first-hand knowledge of actual working conditions, will be in an excellent position to evaluate and appraise their patients' occupational complaints. The Grant County plan certainly deserves a great deal of consideration by medical societies and industries in that and other localities. Through such an intimate cooperation a mutual understanding of each other's prob'ems will develop. This in turn will lead to better medical care, lessened absenteeism and increased production.

In *Monthly Bulletin*, Indiana State Board of Health, July, 1945.

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"It's Paid For"

THE time when industrial medicine was criticized for being curative and not preventive is well within the memory of even the younger men who are now making it their careers. But that criticism is definitely a thing of the past, for, in the words of DR. FORREST E. RIEKE,* "today, we take a different view of our work. We think, talk and act in terms of preventive medicine and maintenance of health; we treat thousands of minor ailments to prevent serious complications; we cull out those with very early serious ailments and send them to private physicians; we insist that our workers get physician health care and avoid quacks; we examine workers with respect to the demands placed upon them by their jobs, arranging transfers when incompatibilities are found; we search for evidences of disease or injury arising from jobs and try to correct the job or environment so as to remove the injurious factor; we check the environment and advise with the engineers on ways to 'build-out' health hazards; and we attempt to 'look at' the workers periodically to see that they remain free of occupational injury and that no degenerative disease process supervenes to make them unsafe in their work." DR. RIEKE might have included also the health education of workers in the matter of their well-being which he so ably describes in his Letter to the Editor on page 716.

We mention this out-moded criticism only in order to emphasize the growing importance and present place of prevention. Long the aim of public health efforts among the larger groups on the community basis, it has now become the principal objective of industrial medicine among the groups of lesser size on the employment basis. And the closer personal contacts of the latter have already developed prevention-consciousness in the private practitioner to a degree never before known. Indeed, the progress in this direction is so rapid that the time is not far distant when medical practice in general and medical education in particular will have been willingly habituated to "think, talk, and act" in terms of preventive measures. This on the part of physicians, with the knowledge imparted by health education on the part of the patients, will constitute the only successful "health insurance." In any other sense, the term is a complete misnomer. The use of the term in the latest regimentation proposal now before Congress is, however, worse than a misnomer; it is a fraud. Because there is nothing in the whole totalitarian structure of the proposal regarding prevention, and prevention is the only real insurance against sickness. The contingency of sickness would be insured against, and the theory of the bill seems to be that sickness will be more generally cared for when it occurs if the person who gets sick has previously paid for the care. But, human nature being what it is, the practice will eventuate that the person who is compelled to pay in advance for medical care which he may or may not need is going to be unsatisfied until he has got it. Thus there will evolve, whether suddenly or gradually, the abandonment of the preventive idea and the fixation or freezing of the existing amount of sickness, because cure has been paid for and is the only thing available—the only thing offered by government medicine.

This is well exemplified in something we heard at our "listening post." An employee standing before a plant bulletin board reached out and put his finger on a health pamphlet paragraph referring to venereal diseases, with the statement: "When we get government medicine we ain't going to have to be bothered with things like this. What if I do get a dose? The government doctor will cure it." Such instances are more numerous than might be supposed. They haven't been talked about, but they should be.

It is evident without elaboration that the proposal now pending represents a complete sacrifice of the practice of prevention to the maneuverings of politics. The whole situation as to government medicine offers a striking analogy to the situation described by our favorite poet when he told about "the hole in the high bridge walk which nobody covered over, while an old fellow got him a skiff and a pole and made it his business to wait below till somebody fell in the river."

Two other echoes from our "listening post" might be interesting. It was lunch hour at a plant. "I don't want it," said one employee. "I've always paid my doctor bills and I always will. And I don't see how they can make me do anything else." "Ask your lawyer," said another employee. "I did," said the first, "and he said he'd like to be the attorney for the fellow who would try to get an injunction restraining his employer from deducting the medical care out of his pay."

"I don't want it either," said the second employee. "But you're a union man," said the first. "I know, I know," was the reply. "The unions are for it lock, stock and barrel. You see, they've got a lot of money—millions of dollars they collected from us for taking care of us when we get sick—and they don't want to spend it."

*From "Health Aspects of Aluminum Ponton Work," by Forrest E. Rieke, M.D., Medical Director, Oregon Shipbuilding Corporation, Kaiser Company, Inc., Portland, Oregon, scheduled for early publication in Industrial Medicine.

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LETTERS to the EDITOR

All the Insurance Company Allowed

TO THE EDITOR:

About two months ago I applied by letter to..... They referred me to..... who I did not know had any connection there. He is their remote chief. I called on the personnel man and he was very anxious to hire me. But—at $150.00 per month. Of course that won't do. I don't want to stultify myself, or the profession. If a man can't make $10.00 for part time, he better work for himself, or hire out on production. Personnel man said that was all their insurance company allowed. It seems, from what I could glean from ....., that they are given some $400.00 to cover the pay of medical men for their large plant. Well—you and I know, the industrial men have been cutting each other's throats for years, and results show. —M.D.

The Best Results in Safety

TO THE EDITOR:

Not wishing to be accused of talking behind your editorial back, I'm sending you a copy of the July issue of *Construction Safety*, in which (below) I disagree with some of the statements made by several doctors in INDUSTRIAL MEDICINE. As a safety engineer intimately familiar with accident experience in hundreds of California industrial plants and organizations, and possessing more than a passing acquaintance with what is being accomplished elsewhere, I can only conclude that said doctors just don't know what they are talking about when they state that 80% to 90% of all industrial accidents "escape the sphere of prevention provided by standard safety programs." There are a lot of very successful safety programs in California, and I'd guess that in at least eight out of 10 of them, the medical profession has had nothing of consequence to do with their success. I have no doubt that doctors could learn to become very successful safety engineers, if they put their best efforts into it, but few of them have the training that would make their work most effective. The best results in safety as a rule have occurred in organizations where the safety director has been trained as an engineer, and possesses an intimate knowledge of production methods. If the medical profession or any other can do a better job of accident prevention than the safety engineer, more power to them. I remain to be convinced that this is possible, as a general rule.

—EDGAR N. GOLDSTINE.

AS A WORKING safety engineer, I get a little tired reading and hearing of all the miracles that can be performed in preventing accidents by various professions and trades. If they can do all these things, why don't they? In copies of a journal of industrial health dated May and June, 1945, two eminent members of the medical profession (one a psychiatrist and the other an industrial physician) state that 80% to 90% of all industrial accidents "escape the sphere of prevention provided by standard safety programs" and "industrial physicians are the ones best fitted by professional training to provide direction of safety programs. The percentage figures given are those due to "personal factors, such as carelessness, apathy, inattention, fear and worry." (Comment: The first doctor has had, I believe, no industrial accident prevention experience; the second, from his references and remarks, appears to be equally uninformed concerning effective and outstandingly successful safety programs. Some industrial doctors working in industrial plants, who are responsible for the safety program, have done exceptional safety work for which they are entitled to full credit—but they are definitely the exceptions. The average industrial doctor practicing in his own office exerts practically no influence on accident prevention. It is my opinion that psychiatrists and industrial physicians might be of assistance to a maximum of 3 to 5% of those injured, as measured by California experience, while some estimates would be as low as 1% to 2%.)

From *Construction Safety*, National Safety Council, Construction Section, EDGAR N. GOLDSTINE, Editor, July, 1945.

Health Instruction Material

TO THE EDITOR:

Our folder containing "health instruction material" was prepared for several purposes. It has been distributed to the top plant officials at our three shipyards as part of an effort to instruct them in the objects and methods of the in-plant health program. They are busy men and many of our health activities have escaped their notice. In the long run, plant management must decide the direction and limits to be placed on health maintenance work done at any plant. Some of our managers are far from convinced of the usefulness of in-plant health work in all its ramifications as presently conducted. They have raised little objection to widespread health activities while busily engaged at war production largely financed by the Federal Treasury. At the same time, every industrial operator who anticipates peacetime production is carefully weighing wartime employee services with an eye to reduction of those not contributory to plant efficiency and with intent to shift all possible expense to community agencies. It is of the utmost importance at this particular time that responsible medical directors keep management on the "mailing list" to the end that economy-minded officials do not discard procedures of great benefit to both employer and employees. These managers will be influenced by facts rather than humanitarian impulses. They are very much inclined to look with a jaundiced eye at wartime activities. Knowing that physicians are essentially humanitarian and that we have crowded our luck in many instances in war plants, they are scanning our suggestions for peacetime operation with more than usual dubiety. It is, therefore, a good time to review with management what we have been doing that works and what we think has been accomplished.

This material has also been distributed to officials and prominent members of the Multnomah County Medical Society. There is a growing feeling among the profession locally that the Medical Society has failed to provide enough leadership to the laity in matters of health education. The President and Council of the Society have recently been instrumental in establishing a Council on Community Health Services for the avowed purpose of analysis, planning, and execution of health activities, which have, for a long time, been carried on by lay groups largely through default of organized medicine. It is highly essential that private practitioners learn more about health instruction methods and activities as carried on by public health agencies and plant medical departments. I do not underestimate the importance of our preventive methods but it remains fact that our plant work is, for the most part, devoted to implementation of community health services rendered by the private practitioner. Whether or not private medicine participates in health education locally, it needs to be aware of such work and favorably inclined thereto.

Our folders have also been made available to several

DR. RIEKE'S letter was accompanied by a folder containing illustrated health instruction material for plant papers, window displays, public address systems, and pamphlets and posters to encourage worker participation in the chest x-ray phase of the company's health education program.

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officials of the University of Oregon Medical School to encourage them to institute stronger courses in public health methods and visual education. The best place to secure strong physician support for this type of health work is in the medical schools with young men who are open to elucidation. As a fairly recent graduate of the local medical school, I can testify to the need for expansion of this type of education for our students.

Some of my friends in public health work have been kind enough to point out that many of our recent plant activities are duplicating steps traversed by trained public health people years ago. It is well to recall that a large preponderance of doctors in industry and the vast majority in practice today have had little or no "public health" training of a formal nature. For that reason, many articles on public health subjects have seemed too general and non-specific to help those on the firing line. For many years, it has been customary to use pictures and step-by-step drawings to illustrate medical and surgical techniques. I believe that large numbers of physicians now find themselves in need of similar, primer-type, illustrated articles demonstrating workable public health education techniques. Unless physicians receive this type of schooling, such worthy endeavors as chest x-ray surveys, cancer education drives, venereal disease crusades, and the like, will fall far short of the desired goal. The efforts of INDUSTRIAL MEDICINE in this direction are to be commended, and, it is hoped, expanded.

It may be superfluous to add that the efforts to stimulate employee interest in chest x-ray services were successful beyond our fondest hopes. We find ourselves short of personnel to handle the numbers desiring films and the other case-finding tests.

—FORREST E. RIEKE, M.D., Medical Director,
Oregon Shipbuilding Corporation,
Kaiser Company, Inc., Portland, Oregon.

DR. PILGRIM

ENROUTE to Florida through the land of the phonetically-named rivers (the Hiwassee, the Coosawattee and the Chattahoochee) for the study of various hygiene problems in a war material plant, noting the while many servicemen traveling in all directions and the absence of civilian men, albeit many civilian women and children aboard. Conferring with officials at the plant, making inspections and having interviews, and a most pleasant conversation with COMMANDER REYNOLDS, he pointing out that at this plant noise was an etiological factor in the spread of colds by the well-known "droplet" infection route, as exemplified by the remark overheard by him when a foreman said to one of his men, "Let's turn our heads to one side and keep our conversation dry." And on one of the inspections, observing a welder working in a ventilated booth at the back of which he had an electric fan which played vigorously upon his head and shoulders, thus discounting the exhaust draft of the ventilating system in the booth, and provoking the well-known remark by one of the safety inspectors accompanying Pilgrim, "Now I have seen everything" . . . . THEN at my office conferring with GEORGE NUERNBERGER anent certain problems of medical department administration and certain important principles concerning the job of medical coordinators in industrial medical departments . . . . AFTER which enroute to Michigan for the visiting of plants and securing of data on industrial medical departments, this time driving for the week-end for a family reunion at brother Byron's suburban home and playing at bridge somewhat badly, but nevertheless enjoying the family circle, especially the twin nieces Joan and Judith, the latter now doing interesting work as society reporter before going back to college, and humorously calling attention to the disgust of one of the officials on the local paper who says that he gets very tired of being addressed as MR. GEORGE AVERILL, *The Birmingham Eccentric*. And much playing of Greig, Chopin and the more modern composers, with sister Olga, and Pilgrim trying out a new piano. . . . THEN to Midland, Michigan, and an interesting conference with DR. DON IRISH and his associates, with emphasis on recent chemurgical advances concerning such things as the manufacture of compounds which will prevent apples falling off the trees (thereby saving a great portion of the apple crop), the production of seedless tomatoes, and the raising of sproutless potatoes—and including many other important technicological developments in the field of employee protection, health promotion, and medical supervision. . . . AND later calling on DR. MAX BURNELL at Flint, DRS. E. A. IRVIN, EDWIN DEJONGH, P. B. RASTELLO, C. D. SELBY, RAYMOND HUSSEY, C. P. MCCORD, C. H. CHASE, and JOHN J. PRENDERGAST, of Detroit, all with reference to administrative practices in industrial health departments, where greatly interested in the variety of subject matter: a formidable employee-education and training program; rehabilitation and women employee activities; the reconstruction of an industrial medical department; plastic dipping of small parts for protection in shipping overseas; a micro-drilling operation employing as the largest drill, one measuring one twelve-thousandths of an inch (1/12,000″); the results of rehabilitation activities showing that of 14,000 ex-servicemen employed, but 30% were restricted to one job, 18% needed general restrictions, while the majority-remainder were accepted without any restrictions; plans for the education and training of young physicians for industry; research on a new serum test for estimating exposure to small amounts of carbon tetrachloride; the medical program of a large retail store employing over 10,000 persons . . . . THEN to the Shawnee Gun Club across the Canadian line for a steak dinner with the brother and his family, being delayed by the customs officers who would not permit us to carry some recently-purchased phonograph records across the line, and wondering sometimes at the supercilious efficiency of public officials. . . . AND later, on a family party to the University of Michigan at Ann Arbor, again meeting nephew Lewis and enjoying a clever wartime farce "Over Twenty-One" by Ruth Gordon, featuring the Michigan Repertory Players. . . . ENROUTE to Chicago again by automobile, listening all day to the news of the war's end on August 14 and coming to the residence just as the final news was announced over the radio—with a feeling of great gratitude that it is all over, in spite of our loss and the losses of many others, and with the fervent hope that it will all be handled properly so that there will be no more conflict. . . . AND now in the laboratory with many and sundry problems and at the desk with consideration of reports of technical nature, meanwhile considering problems of editorial matters and manuscripts on diverse subjects. . . . AND a pleasant week-end reunion with CAPT. FRANK XAVIER, M.C., (a former associate), now on leave and with his family, and hearing of the problems of Belgian, French and British physicians, who seem to get along so well with so little. . . . THEN journeying to Purdue for another lecture at the Industrial Vision Institute, and again renewing warm friendships with the faculty of the Institute; and enjoying extra-curricular music, and food and drink of the best, and much impressed by the sustained and keen interest of the students, particularly with reference to medical relationships within and without the factory walls. . . . AND with the Board of Directors of the Chicago Section of the AMERICAN INDUSTRIAL HYGIENE ASSOCIATION on plans for programs for the season, and especially noting that reconversion has already left its mark on the Board, causing the loss of four members who are now moving to other localities. . . . AND preparing itineraries for extensive trips and particularly a sojourn into Ohio, of which in later notes.

DYSMENORRHEA

"There apparently exists in the constitution of the dysmenorrheic woman an intrinsic factor that renders her more susceptible to pain . . ."*

Harman, J. O.: Am. J. Obst. & Gynec. 47:686 (May), 1944.

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Economic, Professional and Humanitarian Benefits of Industrial Nursing Services

CRIT PHARRIS, M.D.,
Assistant Medical Director,
United Aircraft Corporation

THIS discussion of the economic, professional and humanitarian benefits to be derived from industrial nursing is presented with the knowledge that I can say little which has not already been said many times. You have enjoyed more publicity during the past few years than ever before, and more than any other group of industrial health workers. The recent expansion of industrial nursing has been due largely to the war, but not entirely so, because the service had reached the stage where further extension and improvement was inevitable, war or no war.

Although the war has stepped up the rate of progress, I believe that much of the gain will be retained after the war is over. Of course, there will be some retrenchments. Some valuable programs will be lost while others will be modified in one way or another. However, industrial nursing will come through the postwar readjustments stronger than ever before. This is not just wishful thinking or over-enthusiasm. It is a logical prediction based upon confidence in your ancestry and a firm conviction that industrial nursing is an absolute *must* in the future pattern of industrial health conservation.

You are interested in taking further stock of where industrial nursing stands today, and in charting your course more clearly. I believe that you would like me to present your case, in part, by pointing out some of the benefits to be derived. I understand that you have in your midst, representatives of management, as well as other non-nursing guests, who have been invited to participate in the evaluations.

If we are to examine the benefits of industrial nursing service, it would seem necessary to deal with the various types of services and their relationships to other health and welfare programs. This type of evaluation is not simple for the reason that there is no absolutely impartial judge who is thoroughly qualified to pass upon the merits of the service from both the professional and lay points of view. Nursing services often are judged in relation to other in-plant programs, and by laymen whose stature reflects itself in the quality of nursing care, as well as in other plant programs with which nursing is compared. Minor likes or dislikes, prejudices and predominating interests in the mechanical, or purely productive aspects of industrial activity, often make up the perspective of some judges. Such plant officials are poorly qualified to pass judgment, but they must be reckoned with along with the able executives who have ample ability to judge nursing services fairly, even though from the layman's point of view.

Then there are the professional people, nurses and doctors, who judge the service from other angles. They often make the mistake of taking it for granted that since they are sold on the values of nursing services everybody else also should be convinced. To effect a "meeting of minds," or to cause these different types of individuals to view the service rationally and from the various vantage points is a difficult task. But, the manner in which we approach this objective will reflect itself in the final judgment which is passed.

How then, can the merits of industrial nursing services best be presented? Let us assume that we who are engaged in industrial health work are the vendors and that we are calling upon plant officials having nursing programs which they are none too proud of, or, that they are potential purchasers interested enough to listen to our sales talk. How should we go about the job?

It would seem that the first step would be to determine that the "purchaser" is sold on the basic values of general nursing services. In view of the proved value of hospital and bedside nursing, such a task would not seem at all necessary. But when it comes to selling nursing service in industry the complexion changes somewhat.

We must admit that industrial nursing and private duty and hospital nursing are not one and the same. The nursing training schools, with few exceptions, turn out graduates peculiarly trained for the latter types of service but with little, if any, specific preparation for industrial work. So, how can we expect industry to regard industrial nursing in the same light as private duty and hospital services? Many mistakes have been made by attempting to sell industry short in this respect. Nurses who were very successful beforehand have failed miserably as plant nurses simply because they were not industrial nurses and, for some reason, never became qualified as such. So, if we expect to get anywhere let us be sure we have industrial nursing service to sell. Granted that we do, what type and how much of it shall we prescribe for a given plant? Our next fundamental step is to know enough about industrial nursing in general, and nursing needs in given plants in particular, to be able to offer the proper type to the proper plant.

It would appear logical to go over our stock at this point and classify the various types of service which we are able to offer to industry. They may be classified in respect to type, size, quality and extent of coverage.

Types of Industrial Nursing Services

THERE has been much discussion recently about the minimum size of plants justifying nursing coverage. Some have said that there should be one nurse for each 500 employees; others have set smaller and even larger figures. The consensus among industrial nurses and physicians is that any plant, regardless of size, can profitably utilize nursing service on some basis. Beginning with part-time visiting service provided by community health agencies, coverage ranges upward in proportion to the size of the plant and the character and magnitude of the health problems.

VISITING NURSING SERVICE: The part-time visiting service by community health agencies is the most elementary and least highly specialized of all types when judged by modern industrial nursing standards. The nursing staff, although trained in public health, seldom possesses special knowledge and skill relating to industrial problems. There are some exceptions, however, and in such cases, effective industrial nursing care is being provided. V. N. A. programs are of value to the plants too small to afford any of the other types of coverage to be mentioned later in this discussion. Plants with upward of 50 to 75 employees each not having any unusual in-plant health problems are the types to which this service should be limited.

PART-TIME INDUSTRIAL NURSING SERVICE: The next type of nursing

Read at meeting of The Industrial Nurses' Association, Industrial Management Council, Rochester, New York, June 19, 1945.

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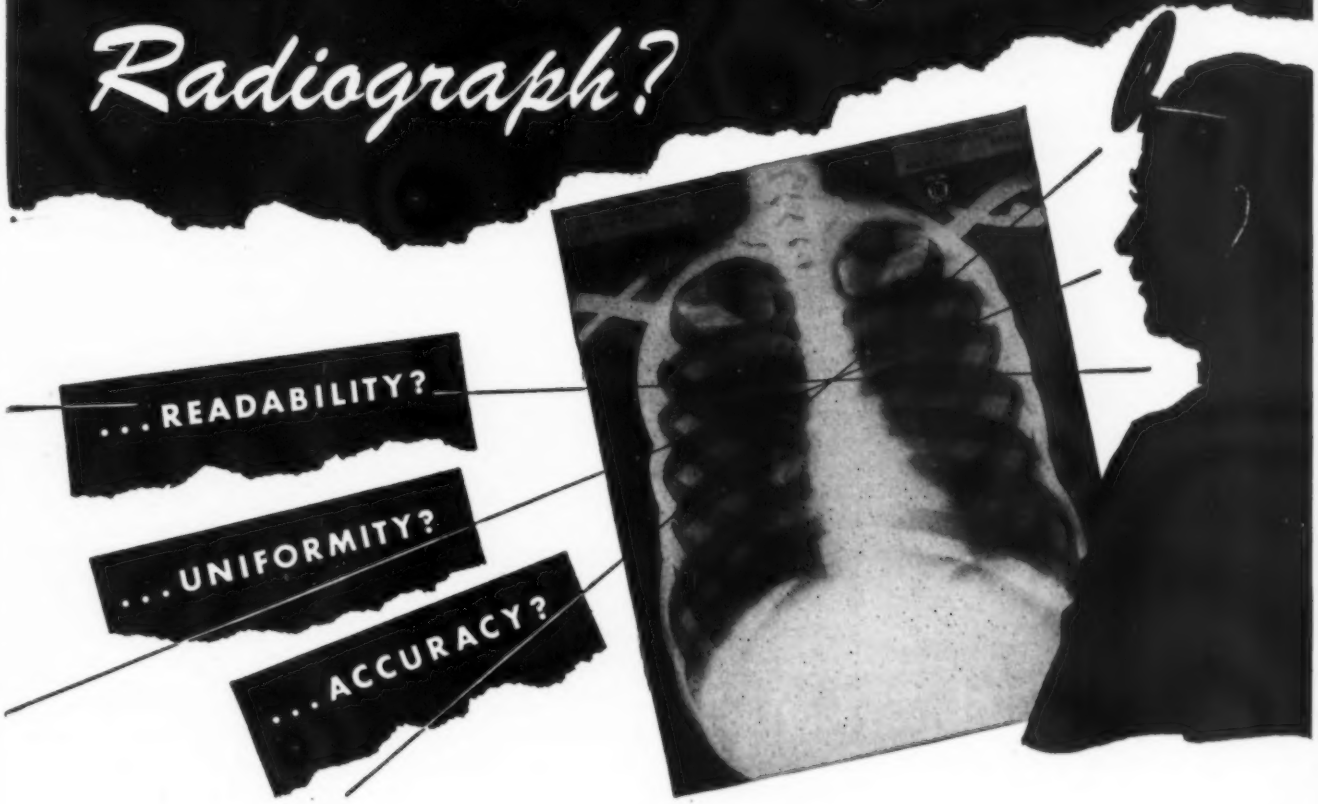

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coverage which I should like to mention is part-time service by trained industrial nurses. Such a plan provides for a single nurse to allocate her time to two or more plants on a basis governed by the size of the plants and the types of problems. This plan is, in my opinion, the most elementary type of industrial nursing coverage worthy of the name. It should be sponsored more extensively than is the case today, and it is predicted that the number of nurses working on such a basis will increase rapidly after the war.

FULL-TIME INDUSTRIAL NURSING SERVICE: Full-time care is the type of coverage we usually visualize when talking about industrial nursing service. By the term "full-time" we mean that the nurse devotes her total professional time to a single plant. The number of nurses employed on such a basis in a single plant may be one or several hundred. This is the type of service which we advocate for all plants having the number of employees or problems justifying it. Full-time nursing service may be found in some plants with as few as 75 or 100 workers, although the number usually is at least 250 or more.

Scope of Service

SO MUCH for the basic types of service in so far as time coverage is concerned. Let us next consider the service from the standpoint of scope and quality.

The fundamental objective of industrial nursing is to employ techniques, either generalized or specialized, adequate to effect satisfactory solutions of unsatisfactory industrial health situations. The extent to which this goal is attained naturally varies greatly. Some nurses have achieved results which would have brought them much greater fame had they been engaged in more dramatic activities. Others have been discreditable to their profession. However, the sum total of accomplishments has been outstanding.

The scope and quality of industrial nursing service also may be classified into three basic groups.

"REPAIR SHOP" SERVICE: The most elementary and rudimentary type consists of the simplest therapeutic care to accidents and illness cases. This is the "repair shop" variety, wherein the nurse sits in her quarters and waits for cases to come to her. She is not productive of anything except a sedentary existence. The same types of injuries and illnesses may come and go day after day, but they do not trouble her so long as she is not overworked, gets paid regularly, and is able to be on her way out of the plant via the nearest exit at the end of the shift. This is the type of nurse that has done so much to perpetuate the title "first-aid," for in reality her services are little, if any more than just first-aid. It should be said, however, in fairness to the profession as a whole, that such nurses are largely limited to plants having the same general type of incompetent medical and welfare programs.

Unfortunately, this type of nursing service is none too infrequently found even today, and many plant officials judge industrial nursing by the accomplishments of such nurses. There is little wonder then that some plants still provide only the most elementary type of care and feel that a graduate nurse is not necessary. A serious threat to the standards of industrial nursing is presented here, and the attitude of industry is not entirely unjustified. There are numerous trained first-aiders, trained attendants and practical nurses who can put on as nice a bandage, pass out aspirin tablets as graciously and knit as artistically as R.N.'s. Many of these people also can hold their own in other respects, and, in some instances, they excel over some graduate nurses.

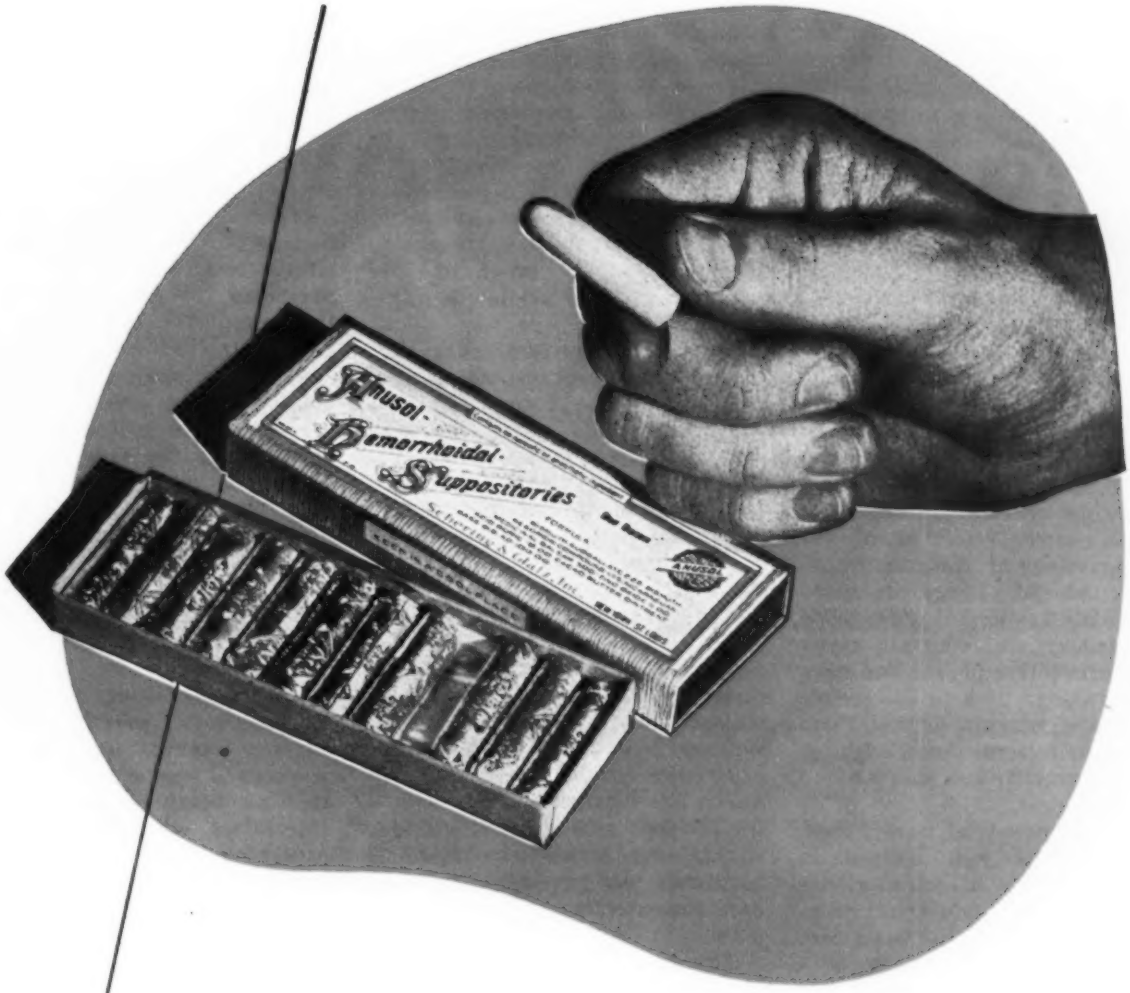
GENERALIZED INDUSTRIAL NURSING: The second type of industrial nursing I should like to discuss is the one which provides ample therapeutic care and at the same time concentrates upon preventive effort. Nurses who participate in such a program usually enjoy the support of competent plant physicians and are in industries which are actively interested in the betterment of health conditions.

The care of industrial casualties always has been a prime function of a majority of in-plant health programs, and this type of service will continue to be of basic importance so long as job-connected injuries and illnesses are to be found. The good plant nurse renders skillful service to such cases and carries on numerous other activities related to them. She, or he, is held accountable to the plant physician for the handling of cases in the absence of the doctor. Other duties include keeping accurate records, maintaining supplies and equipment in proper order, participation in physical examinations and functional capacities evaluations, assisting with operations, and generally discharging all the recognized duties of modern plant nurses.

In so far as the therapeutic assistance goes, the industrial nurse functions in essentially the same manner as in the hospital or on a private case. There is one important and unfortunate difference, however, which is too often found. Whereas, the private duty or hospital nurses work under the close and specific guidance of physicians, plant nurses often have to get along in the absence of physicians without any specific instructions, standing orders, or general methods of procedure which bear the endorsement of the plant physician. This is an illegal and unethical arrangement which tends to jeopardize the legal status of the nurses and nullify the beneficial services which they might be rendering.

The plant nurse, whether working alone or as a member of a large staff, should be concerned with the prevention of job-connected disorders, and with the general betterment of employee health. Each industrial injury or illness is proof of the inadequacy of preventive procedures. The nurse who handles such cases, and uses each one as an object lesson in efforts to promote safety, is truly practicing preventive therapeutics. To do this job successfully, the nurse not only must know how to apply modern nursing techniques, but she, or he, must know enough about the cause and effect of the underlying accident to figure out how the injury occurred and be able to adopt the type of strategy necessary to make the injury an object lesson to the worker. In short, she must be able to combine competent care for the disorder and sound preventive advice into a form of preventive therapy which will be pleasant and convincing to the worker.

Nurses need not know how to operate each machine or process, but they should know the fundamentals of employee activity and be on speaking terms, so to speak, with jigs, dies, lathes, plating tanks, and other types of equipment and materials used in the plants. To visit the worker on the job, even occasionally, and express a lively interest in what he is doing will do more to break down plant hospital phobias and gain proper cooperation concerning his health problems than otherwise would be accomplished by spending hours on technical lectures in the hospital. If you convince the average worker that you are truly interested in his job, and in keeping him on it, he will decide you are a "good gal" and, later, when you try to sell prevention to him you will decide



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that he is a "good guy" because he will cooperate with you.

I have not said anything so far which should suggest that the successful industrial nurse must be a specialist in plant operations as well as in nursing. I have tried to emphasize the fact that no nurse can stayed cooped up in the hospital or nursing station and do a real preventive nursing job. I will concede that some nursing staffs are large, or otherwise organized on such a basis that each nurse cannot find the time to become thoroughly acquainted with employee activities. In such instances, these remarks relate to the staff as a whole and not to individuals. What I have said for the nurse working alone, or in a small group, goes for the large staffs. Somebody must know and practice these angles, otherwise the nursing service is no better than the simple "repair shop" variety regardless of the number of nurses employed. Large organizations usually have area supervisors, group leaders, etc., who can carry out the preventive phases and pass their knowledge back to the nurses on fixed assignments so that they, too, can gain some knowledge of preventive activity and pass it along to their charges.

The good industrial nurse, then, is one who is well trained in the fundamentals of nursing, has formed specific industrial techniques and combines the basic care of job-connected disorders with sound common-sense attempts to prevent the cases from developing. She need not be a safety engineer or personnel supervisor, or take on the specialized duties of other plant officials. But she does need to work closely with such people, and above all, she must be able to exert a wholesome influence upon the employee's frame of mind.

A majority of the injuries which occur in modern plants today are due to failure of employees to observe simple common-sense safety precautions. Many of these people easily can be converted into safe workers if somebody will only spend a little time on the task. I do not know of anyone who is in a better position to do this than is the nurse while taking care of cases.

"Specialized Industrial Nursing"

THERE is another field of service open to nurses which has not been exploited to a very great extent, but it is one worthy of greater consideration. I am referring to specialized jobs in health conservation programs. In the well-rounded preventive nursing program of the type which individual nurses, or those who are attached to small staffs carry on, the nurse is something of a "generalized specialist," coping with various types of health problems. But, in this more highly specialized service which I wish to speak of now, there is ample opportunity for nurses to devote full time to individual types of health problems. Our experience in the United Aircraft Corporation convinces me that nurses employed on such a basis can be of considerable value. As proof of this statement I should like to cite a few examples.

DERMATITIS CONTROL: The dermatitis experience in one of the divisions of the corporation had been consistently above the rate one would expect under more favorable conditions. It was felt that material reduction of the problem required specific attack, but owing to war-time shortages in trained plant physicians and industrial hygienists, it was not possible to assign such talent to the job. We assigned a nurse to this program early in 1943 and gave him all the medical and industrial hygiene assistance possible. The dermatitis experience soon began to improve, and it has continued to do so until, for the past nine months, our total weekly case attack rate for both industrial and non-industrial cases has consistently remained under 0.2%.

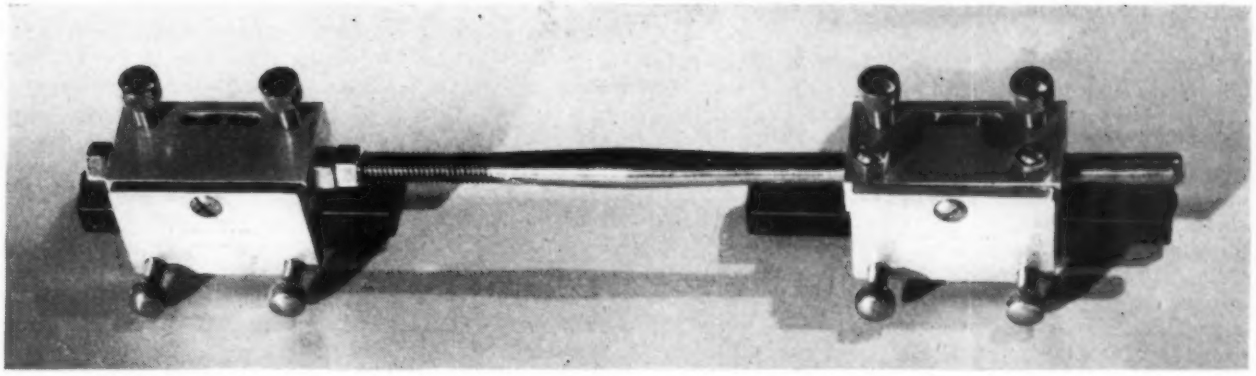
The most noteworthy improvement was brought about through cooperation with the plant engineering and oil departments, and foremen, in the substitution of less injurious, but equally as good, oils, solvents and other materials, for those which were found to be causing serious dermatitis problems. Other methods of attack included improvements of washing facilities, education of employees along the lines of prevention, etc. One of the most noteworthy accomplishments was in helping our nurses in the area nursing stations gain better knowledge concerning the prevention of dermatitis, which they in turn could pass on to the workers with whom they were in daily contact.

The dermatitis situation in this division of the corporation has been improved to the extent that we already have shifted the male nurse's interests in other directions. He now is rapidly developing into a capable industrial hygiene inspector, under the guidance of the industrial hygienist of the division, and is effectively coping with other health problems in addition to dermatitis which he now can handle on a part-time basis.

NOISE CONTROL: Noise is an important problem in our plants. Again, owing to the lack of trained noise control experts, we put industrial nurses on the job. Two nurses are devoting full-time to this project in two divisions of the corporation. Their services include audiometric examinations of workers to determine degrees of hearing loss, fitting of ear plugs, determinations of noise intensities with sound level meters, consultation with plant engineers concerning the elimination or reduction of noise, etc. Effective control of noise in industry necessitates more complete developments along several lines. For example, there still is little agreement among the experts as to the maximum intensity of noise to which workers may be exposed without suffering permanent hearing loss. Our nurses are carrying on their work in such a manner that we hope eventually to answer some of these questions to our own satisfaction, at least. In the meantime we are taking steps through pre-placement selection, frequent hearing examinations, persuading workers to wear ear defenders, correlating hearing losses with noise intensities, advising with the engineering department and supervisors on control problems, etc., to provide our employees with modern noise control service.

SPECIAL JOB PLACEMENT PROCEDURES: A great deal of attention is being given to the question of pre-placement physical examination of workers, evaluation of their physical capacities, and placement in the types of work which they are physically able to do. Again, we have found nurses to be very valuable workers. In our investigations of the physical demands and hazards of jobs we are employing 21 people at the moment, including nine nurses, four of whom are females. These nurses have been able to hold their own, and in some instances out-perform other members of the service.

An important phase of our overall program dealing with the evaluation of functional capacities of workers includes the follow-up of people after they have been placed on jobs to see how well they are adapting themselves from the physical point of view. The job investigation personnel also checks on cases which the plant physicians consider to be suffering as the result of job-connected disorders. Nurses are peculiarly fitted for this type of work, and have many note-



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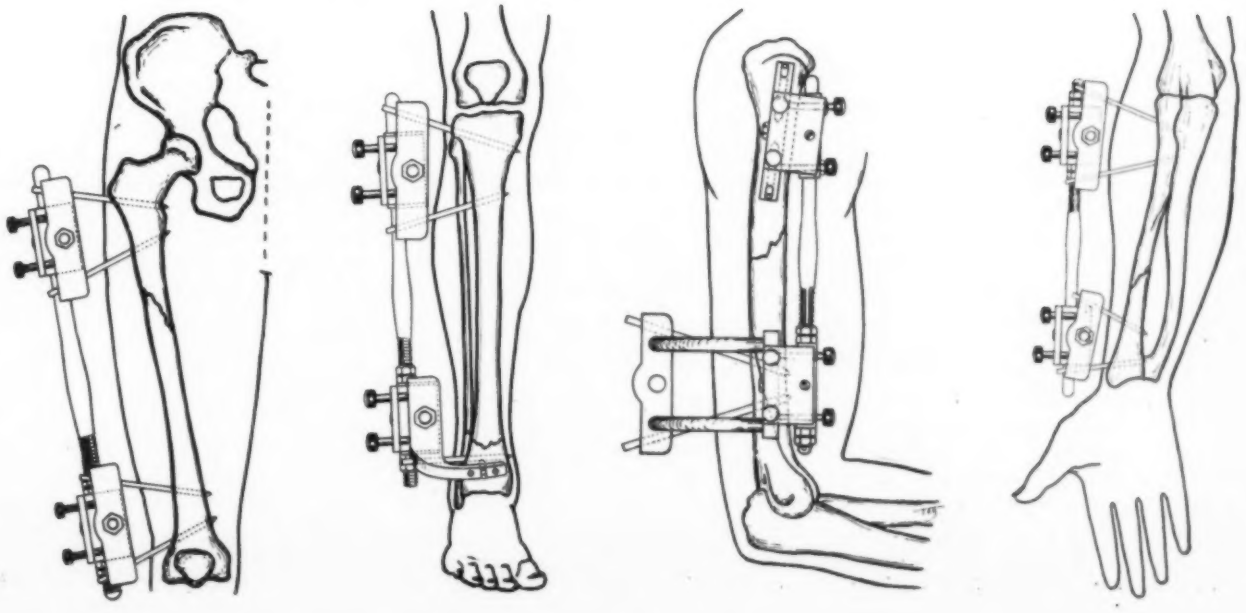

worthy accomplishments to their credit.

We have found that nurses are able to do highly satisfactory work in our pre-placement examination and functional capacities evaluation program. In this program we are evaluating the percentage of the shift time, and the extent to which individuals are physically able to stoop, climb, stand, bend, lift and engage in numerous other physical activities. We already have trained several nurses, and intend to train others until we will have 15 or 20 of them participating in various phases of this program, particularly in the evaluations of functional capacities of the type mentioned above.

Here again we find that "necessity has been the mother of invention," so to speak. Not being able to get enough trained industrial physicians for the job, we have turned to nurses and have found them to be capable of learning and quite capable of assisting the examining physicians in many ways.

SANITATION PROGRAM: When we organized full-time sanitation programs we attempted to employ trained sanitarians but without success. We now have two male nurses working in this capacity, and their accomplishments have been very satisfactory. The sanitarian of one of the divisions has gone a long way already in the development of minimum standards governing the purchase and use of soaps, disinfectants, and other similar materials. He found that, in some instances, the materials of these types being used were far inferior to the claims made for them despite the fact that they were well-known nationally advertised brands.

One outstanding phase of service rendered by these nurses is sanitary supervision of our cafeterias and other feeding services. Thanks to their eternal vigilance plus the high standards maintained by the cafeteria managers and employees, we have not had more than an occasional complaint about the sanitary quality of the food served. These complaints are investigated carefully regardless of nature or validity, and any situation which might be capable of giving rise to food poisoning is promptly corrected.

Other examples can be drawn from our own experiences in using nurses on specialized services. It would not seem necessary to do so, however, because the examples which I have related are considered to be adequate.

Coordination of Services

YOU probably would be interested in our efforts to coordinate all these services, generalized as well as specialized, into a single effective over-all nursing program. As was pointed out in the discussion of the dermatitis control program, the specialized nurses do not function in an isolated manner. To the contrary, they serve as consultants to the nurses who are in our "front lines," so to speak, and in daily contact with the workers. The results of the special services are given to these station and hospital nurses in such a manner that they can utilize the information in their "preventive therapeutics."

This type of utilization is made very effective by the full-time nursing instructor and educational coordinator. When he sees that some nurse, doctor, industrial hygienist, or anyone else is doing something which is of value to the nursing group as a whole, he sees to it that the program is brought to the attention of the entire staff. We have experienced a very marked shift of emphasis from straight-line therapeutic service to prevention. Certain nurses, along with other members of the medical department, play specialized roles in this program but we do not have any place on our staff for anyone who is not interested in carrying out his or her share of our over-all program.

Our accomplishments along these lines still are quite small in many respects. Some of the activities are as yet largely in the developmental stages. We have confidence in them, however, and feel that they will measure up to anticipated levels of success. Many of these services are strictly war-time products, but for the simple reason that war-time situations made it expedient, and also possible, to get them under way. The extent to which this entire preventive program will be carried on after the war must be decided later in light of postwar circumstances, but we are proceeding with the determination that, whatever our postwar health program is like, preventive measures will continue to be of great relative importance. We also intend that the role which nurses play in the program retain the same degree of significance as at the present time. While we admit that nurses were given greater responsibilities in the various preventive projects than would have been the case had others with specialized training been available, we have found that they are capable of developing into satisfactory workers along these lines.

Economic Advantages

THUS FAR I have dealt largely with the basic types of industrial nursing and the scope and quality of services rendered. I have not said very much about the economic advantages. If you are expecting me to present a concise statistical analysis of the dollars-and-cents values, then I am afraid you will be disappointed. Many attempts have been made to put such evaluations upon the service, but a complete job has not been done by any means. Such estimates can be made only to the extent of predicting the savings in doctors' bills, reduction of time lost to production, and in other specific savings, particularly by having the cases handled on the grounds rather than by sending them outside for care. These savings are somewhat tangible and often can be related to insurance premiums and other overhead costs.

Industrial nurses, like industrial physicians, got their start chiefly because of their economic influence upon workmen's compensation insurance costs. It did not take some plants long to see to that it is cheaper to treat the average industrial case in the plant than to send it outside. I am sure that you will agree that if management did not recognize your services as being an economic asset many of you would not be employed in industry today.

The very fact that there are more than 11,000 nurses employed in industry in the United States today is of much significance from the economic point of view.

It hardly seems possible to do more than approximate the economic values of nursing services. The principal returns usually are in terms of improved morale, increased efficiency, reduction in absenteeism and other intangible human reactions.

A good nursing service seldom, if ever, finds itself in the position where its existence is contingent upon showing a profitable balance on the ledger. If modern nursing therapeutic techniques are blended properly with preventive efforts, support of the employees and other direct beneficiaries will have a greater "selling" value than any set of figures on the credit side of the ledger. Show me a personnel department, or even a safety department, which can compute all of its economic values, then I will become more seriously concerned about the total dollars-and-cents values of nursing services.

If plant officials have confidence in your accomplishments as nurses,

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they are not going to be too greatly concerned about costs so long as they are in harmony with other budget items. If they do not have confidence in you, there probably is a good reason, and they will not be greatly impressed by any financial figures which you can show.

Professional Advantages

THE professional advantages of modern industrial nursing services are of significance to management, employees, plant health programs, and to the nursing fraternity. I already have referred to some of the influence which plant nursing programs of various types have upon standards of plant health programs in general. I think some of these advantages might well be brought into sharper focus at this time.

The professional advantages can be related directly to the type of coverage whether by visiting nurses, or by part-time or full-time industrial nurses. But these advantages are more directly related to the scope and quality of service and to the qualifications of the nurses.

I do not concede that there is a place in the future pattern of industrial health service for any people to be employed as nurses unless they possess the minimum professional and legal qualifications. I am not advocating that trained attendants, or others with similar types of qualifications who have demonstrated ability to do the work for which they have been trained, should be discharged. To do so would not only be unfair, but also would deprive industry of the valuable services of many people. I see no reason, however, why we should continue to bring such people into positions requiring painstaking in-plant training before they can be put on jobs which could be more readily and satisfactorily filled by graduate registered nurses. It cannot be denied that, even from the standpoint of theory alone, there is any professional advantage of employing nurses with adequate basic preparation.

A graduate registered nurse is not necessarily an industrial nurse, even though she, or he, might be employed in industry. Nurses without post-graduate training or experience, or who show no capacities for development as industrial nurses, cannot be exhibited as professional assets. These nurses are the type already referred to as the "repair shop" variety that have done so much to distinguish their services with the title "first-aid."

The nurse who can successfully combine modern therapeutic and preventive techniques, or is rendering satisfactory but more limited service on a "teamwork" basis in a large organization, is worthy of being called an industral nurse. Such a person is creditable to the entire nursing profession in that she, or he, is able further to demonstrate the versatility of the nursing profession as a whole.

Some nurses in industry unfortunately are not practicing their profession according to proper professional and legal standards. These improper activities are due in some instances to nurses who feel that they are competent to practice various branches of the healing arts. In many other instances, such faulty acts are actively encouraged, or even ordered by physicians. Such practices should stop, and any nurse who assumes them voluntarily, or otherwise, is not upholding the standards of the profession. Physicians who encourage or order such violations are degrading both the nursing and medical standards.

Industrial officials naturally should not be considered capable of judging the professional standards maintained by their nurses. They are human beings like the rest of us, and are susceptible to the same types of deception, "supersalesmanship," etc. They naturally wish to buy the service which will net the best returns. The professional standards which nurses maintain will have a marked influence upon their selections.

Humanitarian Advantages

EVALUATIONS of humanitarian advantages are beset with about the same handicaps as mentioned for the financial advantages. I shall not go into them to any great extent because I would only be repeating many of the statements already made. It should seem sufficient to say that the humanitarian advantages also are directly related to the extent of coverage and the quality of services rendered. The employee is a more sensitive "barometer" than some of us might think. It is generally true that if you want to learn how efficient your services are get a cross-section of the opinions of the workers. If that consensus is good, then you may feel confident that the humanitarian advantages are creditable; but if a majority of the workers call you "butcher," "faker," or some other similar names, they probably are correct.

One of the cardinal objectives of any health program is to render efficient, impartial and friendly service. The typical "first aider," whether a layman or graduate nurse, is on the way out, certainly in all except the smallest industrial plants.

Other incompetent plant health workers, whoever they are, also are in a similar situation. Competent plant health workers, then, will have a better chance than ever before, and the scope and effectiveness of their services will be proportionally extended.

Summary

IN THIS discussion of the economic, professional and humanitarian advantages of industrial nursing, I have attempted to bring out certain points which should be covered in making evaluations of the services. Effort has not been made to overstate the case for industrial nursing, and some of the defects and shortcomings have been pointed out along with the virtues.

The discussion has dealt briefly with the early development of industrial nursing, and with the future prospects as suggested by recent trends in the development and expansion.

The basic types of services in existence today were outlined.

In discussing the scope of service, I dealt with the most elementary phases such as can be rendered by the average visiting nursing staff along with their regular public health services and by the "repair shop" type of industrial nurse who has earned little if any more renown for herself than to be known as simply the "first aid" nurse. I have emphasized that adequate therapeutic care for job-connected disorders and preventive effort should be blended in proper proportions.

In addition to emphasizing the importance of "generalized" preventive effort, I have cited some examples from our own experience in the United Aircraft Corporation to illustrate the effective role which industrial nurses can play in specialized phases of industrial health work. These examples included dermatitis control, noise control, sanitation, evaluation of physical demands and hazards of jobs, pre-placement physical examinations, evaluations of functional capacities of individuals, and investigations of health experiences of physically defective employees.

All of this presentation was made for the purpose of illustrating some of the economic, professional and humanitarian advantages of indus-

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trial nursing services. No attempt was made to show these advantages in terms of dollars and cents. The opinion was expressed that real evaluations cannot be made in this manner because of the many human factors such as morale, absenteeism, efficiency, etc., which cannot be correctly evaluated.

The importance of maintaining high professional standards was emphasized. The best way to sell management and employees on the value of good nursing service is to give them good service. The belief was expressed that if this is done, the financial advantages will be apparent to management, and that the reaction which employees will register concerning the humanitarian advantages also will be satisfactory.

Chlorophyll Urea Ointment

—In the Treatment of Burns and Chronic Ulcers—

M. D. FINKEL, M.D.,
and
A. J. LEVINE, M.D.,
Chicago

IN THESE days the cutting down of absenteeism in war products industries is an important problem. We have found that burns either of minor or major character, and severe abrasions with loss of epithelial covering were important factors in causing loss of days in the plants under our medical care.

We have accordingly endeavored to find some method of treatment which would materially reduce the period of disability due to injuries of this type. Over a period of several years we have tried many of the preparations available, such as cod liver oil unguents, various dye products and sulfanilamide ointments, with success of varying degree. In reviewing the literature of epithelial stimulants we were favorably impressed by the work of L. W. Smith, as reported in the *Journal of Laboratory and Clinical Medicine*, March, 1944, on the use of chlorophyll. He found that by adding chlorophyll in concentrations of .05 to .5% to tissue culture of embryonic fibroblasts he could produce an immediate growth response with elimination of the usual six to 18 hour lag period. He was able to maintain this growth stimulation by replenishing the chlorophyll strength of the solution every 48 hours. He recommended the use of chlorophyll derivative in the therapy of wounds, indolent lesions, ulcers, and chronic infections, especially those with reduced blood supply.

Again, in May, 1944, L. W. Smith reported in the *American Journal of Medical Science* on the toxicity of a water and oil soluble derivative of chlorophyll. His work showed that the oil soluble derivative tends to be slightly irritating in some instances, presumably owing to impurities because of difficulty in extraction. The water soluble derivatives were not only without toxic effect on man or laboratory animals, but were preferred in clinical use since they are equally if not more effective. He, however, made no report on the use of chlorophyll derivative for burns.

In June, 1943, E. Gahan and T. H. Finkle reported in the *Archives of Dermatology and Syphilology* the use of oil and of water soluble chlorophyll derivative. In a series of 25 cases of ulcers of various types, including an x-ray burn of months standing, they achieved an excellent result with a rapid proliferation of healthy granulation tissue in 19 of their cases. Of the six remaining cases, one proved sensitive to the medication and two stopped treatment before the results could be observed.

WE STARTED our work in March, 1945, with a preparation of chlorophyll 1%, containing 10% benzocaine and 33.2% urea in an ointment base.* For comparison purposes, wherever the lesions were multiple, we have used at the same time ointments containing the same amount of urea and benzocaine but minus the chlorophyll, as well as preparations of cod liver oil and dye ointments. Our cases include burns of varying degrees produced by hot metals, chemicals, hot fats, steam, and burns of electrical origin; ulcers due to circulatory deficiencies and traumatic origin, loss of epithelial and subcutaneous tissue in traumatic or postoperative cases. We list a few examples of each below. To date, we have treated 62 cases in this.

E. M., age 42. Driver of a bus, removed a radiator cap and the steam exploded causing a second degree burn to anterior chest, abdomen, right shoulder, and face. Application of ointment over a period of two weeks—complete healing without scarring.

R. L., age 26. Second degree burn of face from hot metal —one application with perfect results.

A. D., age 12. Second degree burn, palms and dorsums of both hands by acids in chemistry set—two applications, healing without scarring.

H. R., age 53. Second degree burn of right hand from hot oil. Healed completely without blistering in three days.

A. F., age 50. Sent to us by another physician; had finger amputation (third right at 2nd joint) with loss of skin over stump for over three months. Physical therapy and applications of chlorophyll gave 100% epithelialization with remarkable improvement after first application.

H. R., age 58. Varicose ulcer of right inner ankle region of three months' duration—marked improvement after three applications; discharged after two weeks' treatment.

J. B., age 40. Severe abrasions of both knees measuring 5 x 6 cm. Three applications gave complete healing without scarring.

SUMMARY and Conclusions: With the use of a chlorophyll, urea, benzocaine ointment, the following results were obtained.

1. Healing time of burns was reduced at least 50%.
2. New epithelial tissue developed and matured almost overnight, with formation of skin that was flexible and smooth.
3. No single case developed secondary infection where the wound was clean at the onset of treatment.
4. Several cases of long standing seen with infection at the beginning of treatment healed quickly and with no or minimum scar tissue formation.
5. In some cases of burns, there was some complaint of smarting after application but in no case was this severe enough to stop treatment.
6. There were no cases of sensitivity in this series.

*This preparation was furnished by The Warranteed Products Co., Inc., Columbus, Ohio.

Health Research in British Industry

GEOFFREY LAPAGE, M.D., M.A., M.Sc.

CONSIDERABLE technical progress has been made in the last 50 years in Britain in combating industrial diseases such as phosphorus poisoning and lead poisoning. During the war years interest has greatly increased in this field and much has been written recently in the British medical press about the health of the industrial worker and the efforts of Industrial Medical Officers and others to minimize or eradicate the many risks to which industry exposes those who earn their living by it. The endowment by the Nuffield Foundation of three university Departments of Industrial Medicine has further emphasized British realization of the importance of this question.

DR. LAPAGE is a well-known writer on scientific subjects, now engaged on research work at the University of Cambridge, England.

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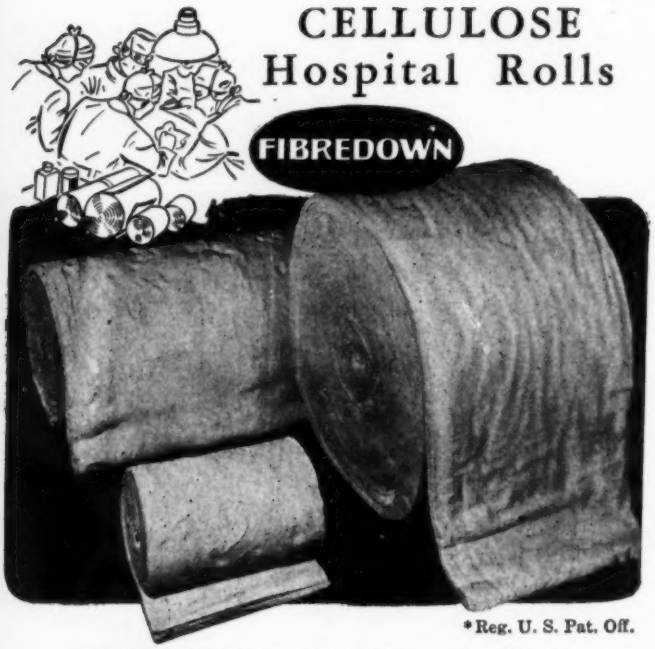

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by WILLIAM D. MCNALLY, M.D.

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For this reason it may be of interest to review two recent publications which deal with it. These are the *Second Interim Report of the Social and Preventive Committee of the Royal College of Physicians of London* (January, 1945); and the Medical Research Council's publication *"Health Research in Industry"* (London, H.M. Stationery Office, 1945, 6d. net), which records the proceedings of a conference on industrial health held at the London School of Tropical Medicine on September 28, 1944.

The former of these two publications represents this Committee's study, during 1944, of industrial medicine outside the hospital. Everyone will commend their conclusion that the worker's home life must be considered as well as the conditions under which he works, because each influences the other. A contented and healthy worker is essential if industrial production is to be efficient.

A useful historical summary of the development of British industrial medicine prefaces this Committee's recommendations. Reviewing existing industrial medical services, the Committee points out that they apply only to a small proportion of industrial workers at their place of work. The Factory Inspectors, whether they be lay or medical, and 1,700 examining surgeons have done magnificent work. But 400 inspectors, including the 16 medical ones and adding the 200 whole-time and 700 part-time works doctors, cannot adequately supervise the 250,000 establishments which are covered by the Factories Act of 1937.

Non-Industrial Sickness

THEY want better medical care for smaller industries, such as hotels and restaurants, shops and offices, the building trade and agriculture. Occupational disability and disease cause only a fraction of the total illness of workers, for they lose about 15 times as many working hours from non-industrial sickness and accident as from occupational accident and disease; and this estimate takes no account of the effects of subnormal health upon efficiency and liability to accidents.

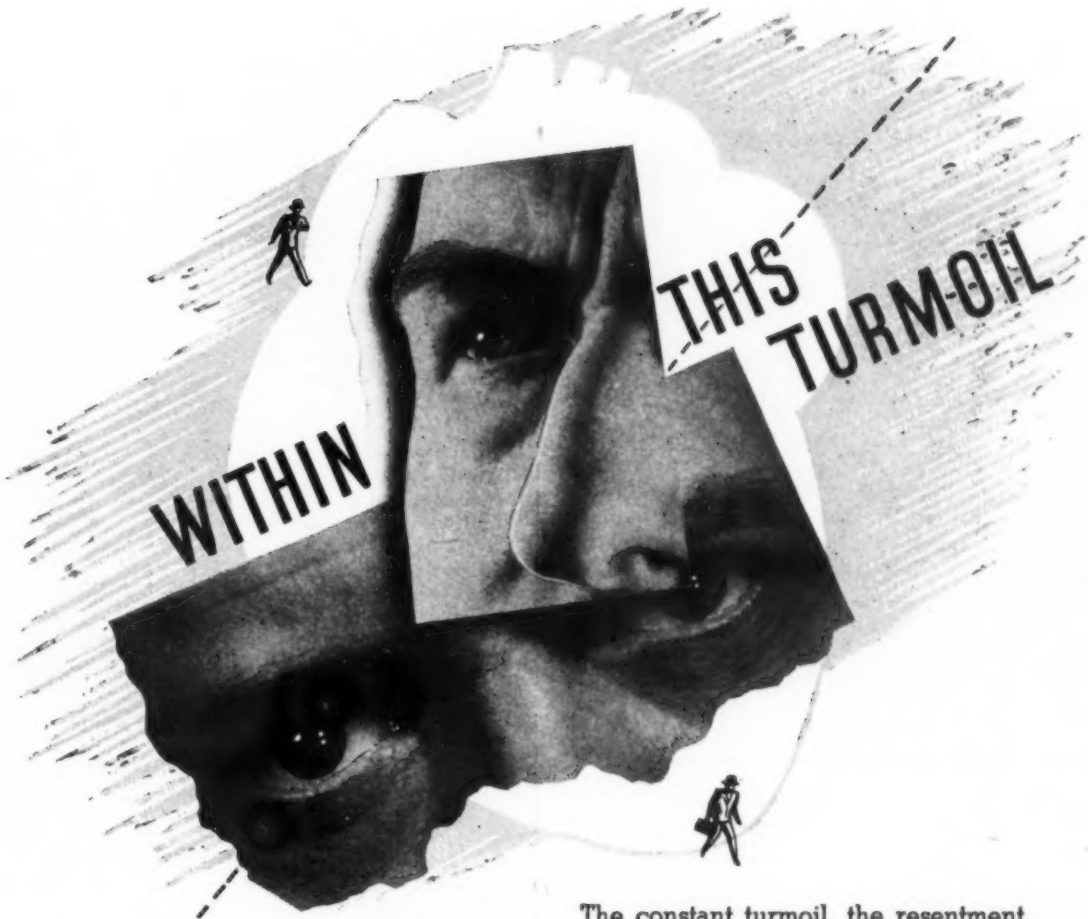
The works doctor should do more than merely examine new workers and weed out the unfit. Continuous investigation is necessary, with the cooperation of the management. The family doctor should be trained as a part-time industrial medical officer. Clinical consultants and research workers should take more part in the prevention of industrial disease. Rehabilitation is essential, and the Committee strongly support the government's *White Paper* on *Workmen's Compensation* (Cmd. 6551), which would do much to establish rehabilitation as part of the National Health Service. The education of medical service obviously requires careful planning.

The medical student is not expected to become an expert on occupational diseases; it is much more important that he should understand the social problems involved and be able to recognize the effects of such factors as fatigue, overwork, monotony and unsuitable work. He should therefore visit factories; and both good and bad industrial conditions should be demonstrated to him. For part-time industrial medical work a short course on industrial medicine would be sufficient, with refresher courses from time to time.

Whole-time industrial medical men would require a more extensive training, which should be based upon the study of preventive and social medicine, so that it would not become too specialized. It should not be taken until at least two years after graduation, one year having been spent in general practice.

A Diploma in Industrial Health would help to establish a minimum standard of training and would provide a recognized qualification; but it would be very difficult to plan a syllabus for it and multiplication of diplomas causes misunderstanding. Before such a Diploma is established, the wider question of post-graduate diplomas in medical subjects in general should be fully considered. Consultants and specialists in industrial medicine should be subject to the criteria for the recognition of consultants and specialists already suggested by the three Royal Colleges.

The report concludes with a section on research which



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links it with the Medical Research Council's publication on *Health Research in Industry.*

Broadened Scope

IN 1918 the Medical Research Council and the Department of Scientific and Industrial Research established the Industrial Fatigue Research Board, which became, in 1928, the Industrial Health Research Board. Both these organizations have done much preventive and clinical research, and many of their recommendations have become everyday practice in industry—with much benefit to the health and well-being of the workers.

This research should continue. The Industrial Health Research Board should study problems of national significance and, also, more local problems which other research organizations cannot tackle. Fundamental research, however, must not be neglected; it should be undertaken by the university departments of industrial health now being established in Britain, and these departments should correlate their work with that of the Industrial Health Research Board and with that of a Division of Field Investigation set up in each local administrative area under the National Health Service.

Some of the achievements of the British Industrial Health Research Board were briefly outlined by SIR EDWARD MELLANBY, Secretary of the Medical Research Council, in his address to the Conference on Industrial Research, the proceedings of which are the subject of the Medical Research Council's publication mentioned above. SIR EDWARD commended another review of the Board's work by DR. SCHILLING in the *British Journal of Industrial Medicine* (1944, 1, 145.).

The Industrial Health Research Board, reconstituted in 1942, was charged, in addition to its existing task of discovering the best conditions for the maintenance of health and efficiency in industry, with the study of the whole subject of industrial medicine and disease.

It is now expected that all the problems formerly studied by the Medical Research Council will come within the advisory capacity of the Industrial Health Research Board. The Medical Research Council has also set up a Department of Industrial Medicine at the London Hospital, under the Directorship of DR. DONALD HUNTER, who edits *The British Journal of Industrial Medicine.*

The War and Industrial Medicine

DR. HUNTER himself discussed at the conference the work of his department on industrial poisons; on the "dead hand" of workers who use pneumatic tools; on the effects of some of the appalling noises to which industrial workers are exposed—such as, for example, those which have made generations of boiler makers deaf—and on the respiratory diseases caused by industrial dusts. DR. HUNTER emphasized the importance of rehabilitation. Discussing the problem of finding useful work for disabled workers, he quoted Henry Ford's remark that there are more jobs in industry for men with one arm than there are for men with two.

During World War II much work has been done on behalf of all the Fighting Services. Many of the principles learned during this work can be applied to industry both during and after the war. The work being done on blood transfusion, traumatic shock and the treatment of burns (see the Medical Research Council's *Special Report Series, No. 249* on the treatment of burns, 1944, H.M.Stat. Office, 4 shillings net) has obvious applications to industry. Studies of the infections to which industrial workers are specially liable and of the problem of sickness absence are also being made.

The Industrial Health Research Board's *Report No. 85 (1944)* deals with the recording of sickness absence in industry, while their *Report No. 86 (1945)* records a study of certified sickness absence among women in industry.

The importance of fitting the machines of both war and industry to the men who must use them, and of fitting the men and women to the machines has also been realized. These problems are being studied by the Medical Research Council's Unit of Applied Psychology at Cambridge, to which a team of the Industrial Health Research Board's

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workers is attached. The work of this Unit was reported to the conference by its Director, DR. K. J. W. CRAIK. Among other problems which this Unit is tackling are the improvement of performance, the effects of boredom, fatigue and noise and the capacities of blind workers. The Unit has devised a new type of recording system which is designed to trace the causes of absenteeism, sickness and accidents.

Management Speaks

THE attitude of enlightened management was presented to the conference by LORD FORRESTER, Managing Director of the Enfield Cable Works, Ltd., and a distinguished worker in industrial and social fields.

LORD FORRESTER said that the fundamental problem was the health of the individual in a healthy environment rightly integrated; plus the integration of the industrial unit with the community; these are two parts of a whole which cannot be separated. He asked for research into management, and into the teaching of it, and also for wider application of the knowledge which we have. He would welcome many more younger-minded, small research teams working on the practical application of knowledge, with consultants to guide them. As a manager he suggested some problems for them.

The first was posture in industry. The position of the operator has been considered in the construction of tanks and aircraft, but there is, in factories, an astonishing lack of consideration of even the ordinary question of sitting and working positions. (In the discussion which followed LORD FORRESTER'S address, SIR WILFRED GARRETT, Chief Inspector of Factories, said that a committee has recently been appointed to consider this problem.) LORD FORRESTER said, further, that a better system of keeping industrial records is required. The problem of working hours needs further study; we should abandon all methods of estimating these hours per day or week; we should think, at the least, in terms of a year. The spacing and duration of breaks in that year are vital to health.

Shift work is another problem, while study and reform of the sanitation and hygiene of factories are urgently needed. Finally the town-planner, the industrialist and the industrial health expert must get together to study the relation of industry to its surroundings. The smoking chimney and similar sins must go. Loss of greensward has important effects on the health of the people. Industry need no longer deface and pollute the land and its rivers; nor need its physical appearance to be an abomination.

Trade Unionists' Wants

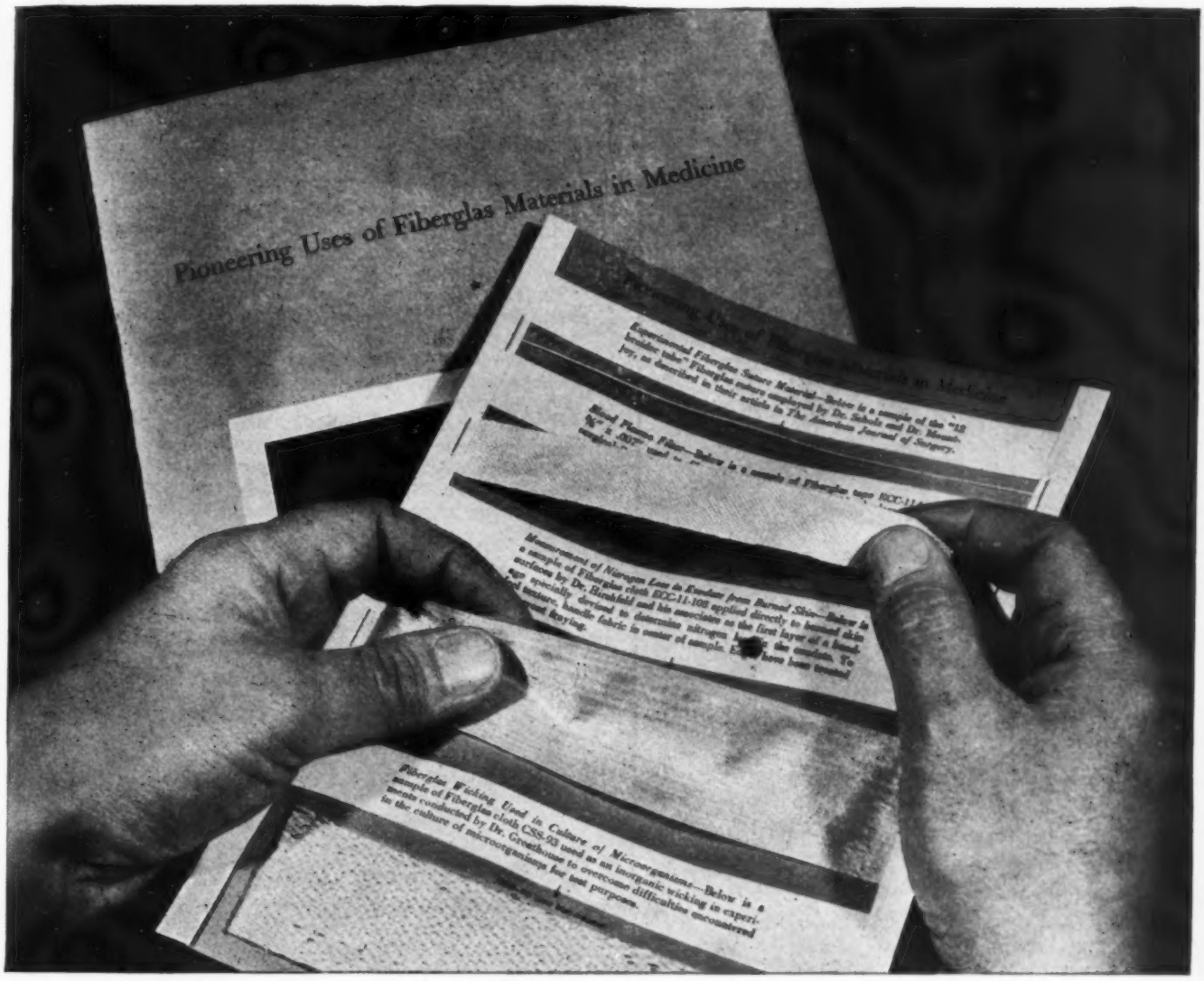
THE point of view of the trade unions was put to the conference by MR. G. A. ISAACS, M.P., General Secretary of the National Society of Operative Printers and Assistants and President of the Printing and Allied Trades Federation. MR. ISAACS is also chairman of the Workmen's Compensation and Factories Committee of the Trades Union Congress and a member of the Royal Commission on Workmen's Compensation.

Trades unionists have, he said, studied industrial health for many years. They have achieved by their own efforts much improvement, have always regarded research into industrial health as important and have pressed for its expansion. It should have ample money, staff and equipment.

The recognition of, and compensation for, industrial injuries and ill-health were not enough; there should be eradication of them. The Home Office and the Factory Department of the Ministry of Labor had done much; he was not complaining of their efforts; but they did not possess the complete research service which the trades unions considered to be essential.

Industrial health caused the workers much worry, and they would always willingly cooperate in any effort to study them. Prompt, accurate and scientific decisions about occupational diseases were required; such decisions should not be the subjects of the arguable opinion of a court of law. MR. ISAACS suggested that more work is needed on the effects of industrial fumes and dusts, on the various kinds of industrial dermatitis, and on the risks of welding.

Both he and LORD FORRESTER emphasized the importance



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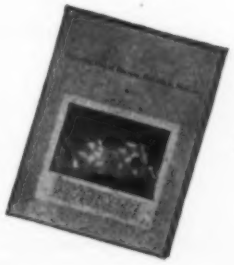

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Foe of Infection

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120 Broadway, New York 5, N. Y.

of communicating the results of industrial research to the workers in language which they could understand.

The desire of the workers in general for more research in industrial health and their great willingness to help it was vigorously expressed by Medical Inspectors of Factories, Industrial Medical Officers and representatives of the engineering unions, who spoke in the discussion which followed MR. ISAAC'S address.

Benefits of Science Are Recognized

THESE two important reports show clearly that there are in Britain far-reaching plans for the amelioration—and ultimately for the eradication, so far as this is possible—of the health risks to which industrial workers are liable.

We have already learned, as SIR EDWARD MELLANBY pointed out, that the result of much research done for the Fighting Services can be applied for the benefit of the industrial worker in times of peace. We must see to it that we neither forget these valuable wartime discoveries nor leave them unused.

It will be the responsibility of the worker, the employer and the state to see that they are utilized to the full.

Happily here is abundant evidence that all who are concerned with industry are nowadays much more alive to the benefits which science can bring to them, and that something more lies behind this increased concern for the health of the worker than the mere fact it pays to fill a factory with healthy and contented people.

Cutting Oil Dermatitis Control

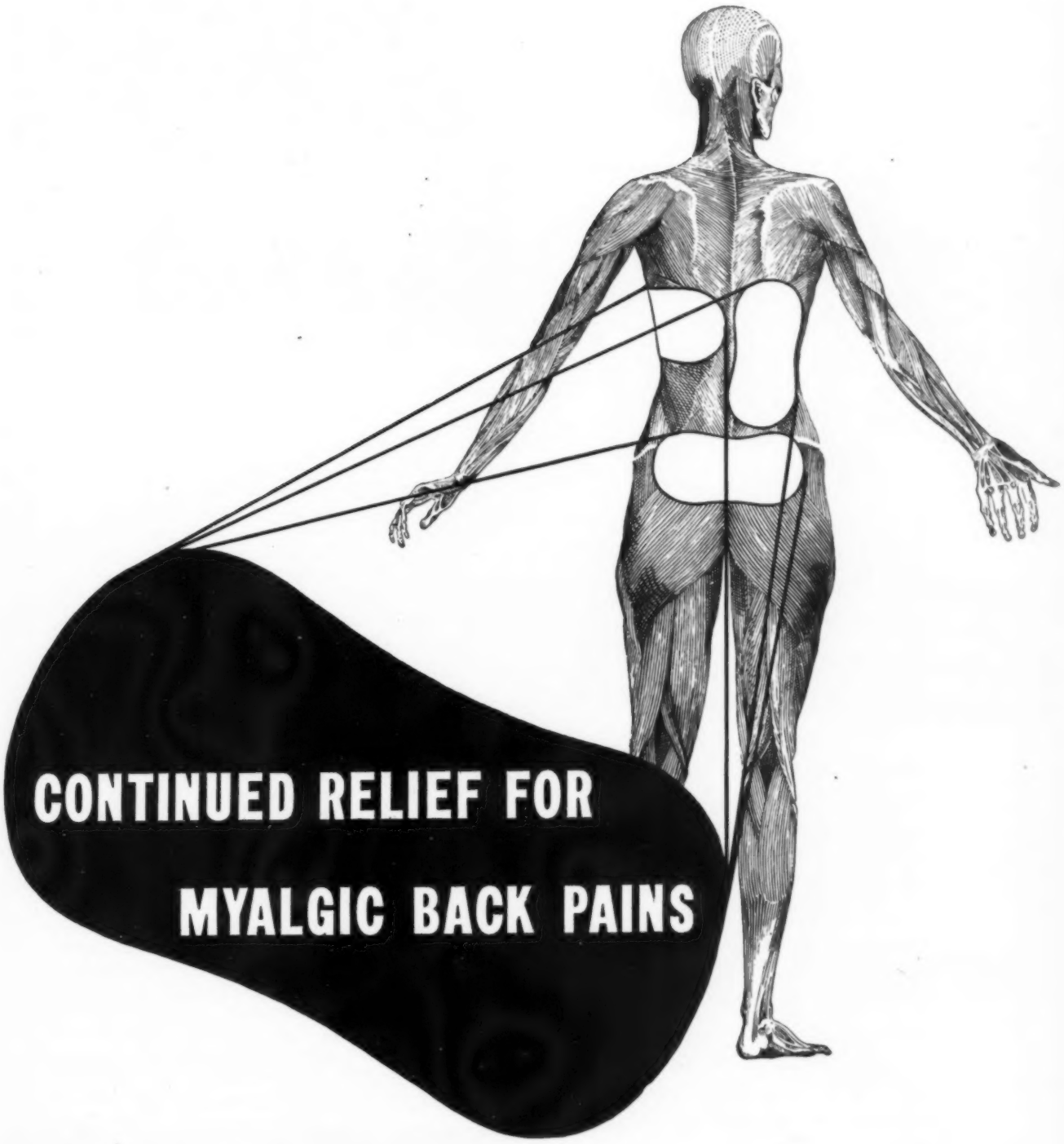
J. L. CARPENTER, M.D.
Medical Director,
and
W. DRURRY CLARK,
Safety Director,
Guide Lamp Division,
General Motors Corporation,
Anderson, Indiana

THREE years ago at the start of our Gun Barrel Department a program was begun for preventing cutting oil dermatitis. Prior to this time we had many cases of dermatitis from oils and since practically all the employees in this new department were to be in constant contact with oils, we realized we were in for a lot of trouble unless some suitable control was adopted.

After studying the literature on the etiology and the method of prevention of cutting oil dermatitis it was apparent that cleanliness and proper selection of employees were the two important essentials, and our policy of control was based on these factors.

In following the policy of cleanliness we attempted to outline our operations in order that as little oil as possible would splash on the operator. In every

Oil shield on La Pointe broach in which lard oil is used. Note that the operator has no oil on his clothing.



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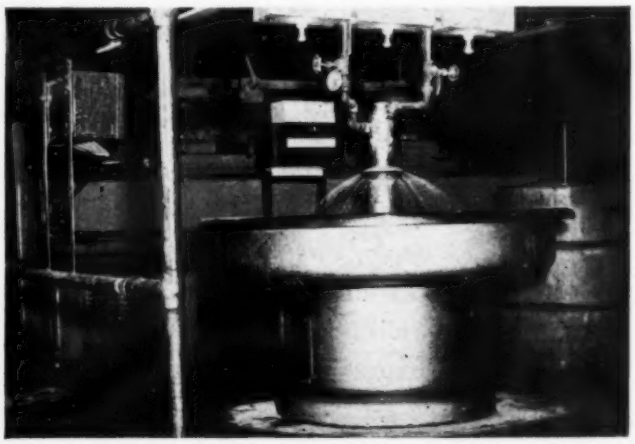
machine, if any splash of the oil or overflow from the operation of the coolant pumps caused the oil to get on the operator, a shield was built around the operation. Floor boards were built up and around the machines so that in very few cases would the operator have to stand in oil or on an oily surface. Oil absorbants were used on the floors and complete janitor service maintained. For the operators' own personal hygiene, wash rooms were made extremely large and two Bradley wash fountains installed in each room. In addition to this, wash fountains were placed in the center of the department (one Bradley wash fountain per 70 employees). The men were instructed to wash frequently, and they faithfully followed the instructions.

For further protection each man is provided with a jar of protective cream, and he is the only one who uses this jar. Cream is supplied from the crib on a requisition signed by the foreman. We feel that protective creams are of some value in the prevention of dermatitis.

To guard against any remote possibility of infection from contaminated oils, all machines using soluble oils are emptied of the oil every two weeks and the machine cleaned with steam or clear water, the old coolant destroyed and a new sterile coolant added. No antiseptics are added. In the case of insoluble oils, each machine is cleaned every 10 days to two weeks, the oil removed and sterilized. The machine is steam cleaned or cleaned with light oil and then new or sterilized oil is placed in the machine. The oils are sterilized by heating at a temperature of 160° for a period



One of the four Bradley wash fountains located in machinery areas

Uniformity is a demand!

(taken from a doctor's diary)

"We are indeed odd, I decided this morning, in expecting variety in many things while demanding absolute uniformity in others. Think how monotonous it would become to read the same headlines day after day... yet how utterly unnerving an experience it would be to find any noticeable difference in the pack of surgeon's blades my nurse opens for the morning O. R. schedule! Luckily, the makers of A.S.R. Surgeon's Blades *always* provide a blade of amazingly uniform quality!"

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in an Aromatic Mineral Oil Base)

delivers prompt Analgesic,
Antipruritic and
Antiseptic action!

For years many industrial clinics have relied on this convenient and effective first aid for emergency dressings and wet packs. Its multiple action works as a mild surface anesthetic to relieve pain, also combats swelling and secondary infection. Prescribed for

Minor skin injuries

Abrasions • Bruises • Burns

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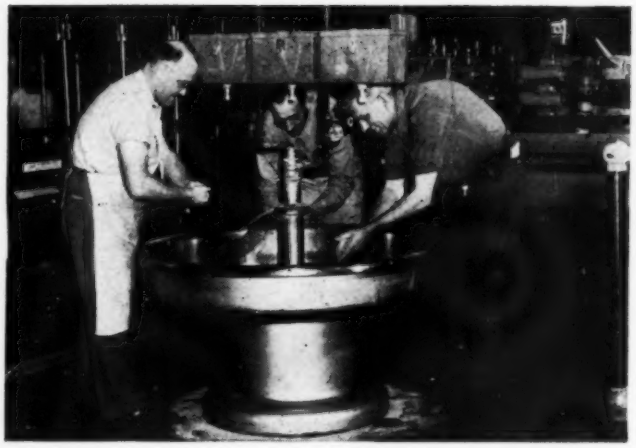

Wash fountain in use. Note the machines in the background

of 45 minutes. The only organism we have been able to culture from the soluble oil is the B. pyocyaneous. We have had no infections of this type.

It has been shown that contaminated oils have no role in producing dermatitis, but frequent cleaning of the machines and sterilization of the oils do have a healthy psychological effect on the employees. They think that dirty oils are responsible for a good many skin rashes.

Proper selection of employees we feel is very important. Applicants were carefully questioned if they were subject to acne or boils, or if they had ever had an oil rash. These individuals were naturally restricted from working in oils. Anyone with acne scars was rejected. Many were rejected at the pre-employment examination because they had scars or subsiding oil lesion on the lower abdomen and anterior aspects of the thighs caused from their previous occupations. Persons with thin dry skins were not accepted. We do not mean these individuals were rejected from employment in the factory, but only that notes were put on their employment cards they were not to work in oil.

By carrying out the above program our plant has worked 18,000,000 man-hours without a lost time case of cutting oil dermatitis. We have had but a very few cases in which a change of job was necessary because of oil folliculitis. We have had one case of exfoliative dermatitis from an allergy to soluble cutting oil; this man is extremely sensitive to the oil. A patch test with soluble oil produced a vesicle in 12 hours.

The purpose of this paper is to offer nothing new in the control of oil dermatitis, but to show that by following the well established principles of cleanliness and selection of employees, oil rash can be eliminated.

RECONVERSION of war plants to civilian production will present a wide variety of problems to industrial hygienists, in the opinion of DR. A. G. MACPHERSON, Director of the Division of Industrial Hygiene, Los Angeles City Health Department. Conversion of ship building yards to ship repair yards already is resulting in actual as well as potential health hazards not previously encountered, he declares. Industries no longer required to comply with Army or Navy specifications as to methods, materials and safeguards may be expected to develop some hazardous practices, especially since in many instances management will be only partially acquainted with the potential health hazards inherent in new methods and materials of production. This is expected to result in a sharp increase of demand for industrial hygiene services from the official agencies. Labor, with a heightened awareness of occupational health protection possibilities due to its wartime experience, probably will contribute to the demand.

Industrial Hygiene News Letter, August, 1945.

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**The name is derived from the Latin verb,* OBTUNDERE, *to blunt sensation or deaden pain. Detailed information about Obtundia and its preparations, with sample, will be sent promptly upon request.*

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Some New Aspects and Approaches to the Problem of Dust Diseases

CARL U. DERNEHL and CARL A. NAU

REFERENCES to industrial disease are suggested in Egyptian, Greek, and Roman writings on mines and mining. Among the hazardous conditions noted in mining was foulness of the air and the amount of dust generated by the mining process. However, it was not until many centuries had passed that the frequency of pulmonary complaints in miners became related to the dust content of the mine air. Paracelsus' pioneering study of "miner's sickness," written in 1534 and published in 1567, suggests dusts as one of several factors that might be involved. Agricola's great classic on metallurgy in 1556 also emphasized the importance of ventilation of mines.

Knowledge of the effects of dusts on the human organism accumulated slowly, but with the advent of the microscope and its application to human pathology in the 19th century, progress became more rapid. The final link in our knowledge came when mass x-ray surveys of miners, stone cutters and others exposed to mineral dusts, became possible.

The increasing industrialization of our country has led to widespread exposures to many dusts previously nonexistent. The realization of these potential dangers by men interested in industrial hygiene has led to rapid recognition of toxic dusts and to steps toward their control. Oftentimes the control of exposure to dust becomes exceedingly difficult, and nowhere is this more apparent than in the case of the laborer exposed to the dust of silicon dioxide. While the many precautions taken have markedly reduced the incidence of silicosis in younger men, those employed over many years all too frequently still show evidence of this disabling disease. In addition, there is always the individual who, because of some imperfection in his nasal filtering mechanism, proves to be more susceptible to silicosis than his colleagues.

Various explanations have been advanced to explain the mechanism behind the formation of the silicotic nodule and the physiologic basis for the symptomatology. For many years silica was considered to be so insoluble that it was believed the presence of the sharp particles lay at the bottom of the pathology. Now it is known that quartz is very slightly soluble in water and body fluids, and opinion is shifting in favor of the solubility theory of origin. Gardner (1940) takes exception to this theory and presents much evidence to suggest that the toxicity is based on certain as yet unknown physicochemical surface phenomena. As an example: Intravenous injection of 1-3 micron silica produces immediate shock in animals, but silica must stand in contact with fluids for 12 to 24 hours before any solution can be demonstrated. That the shock is not embolic in origin is shown by the fact that other materials of the same size fail to produce any reaction.

The exact physiology behind the dyspnea of silicotics is hard to explain. Seldom do men die of silicosis, but rather some poorly handled complicating factor intervenes and causes death. The most prevalent explanation for the dyspnea is that pulmonary fibrosis and the presence of silicotic nodules so decrease the functional area of the lung that the respiratory rate is speeded up in an attempt to to compensate for the decreased area. This theory is not acceptable to many students of the subject who point out that frequently the dyspnea is totally out of proportion to the area of lung involved in this pathologic process. A possible explanation of this discrepancy may be the presence of bronchospasm, first suspected in anesthetized guinea pigs following intratracheal instillation of colloidal silica. Filley and his coworkers (1945) present evidence which confirms the presence of bronchospasm and tends also to refute the toxicity of dissolved silica. By the use of a heart-lung preparation they were able to ascribe a definite broncho-constrictor effect to colloidal silica and to show that this constriction was not produced by colloidal gold and could be relieved by adrenalin. Conversely, the colloidal silica was able to produce bronchoconstriction at the

From the Department of Preventive Medicine and Public Health, The University of Texas Medical Branch, Galveston, Texas. Published in *Texas Reports on Biology and Medicine*, 3:2, 227-237, Summer, 1945.

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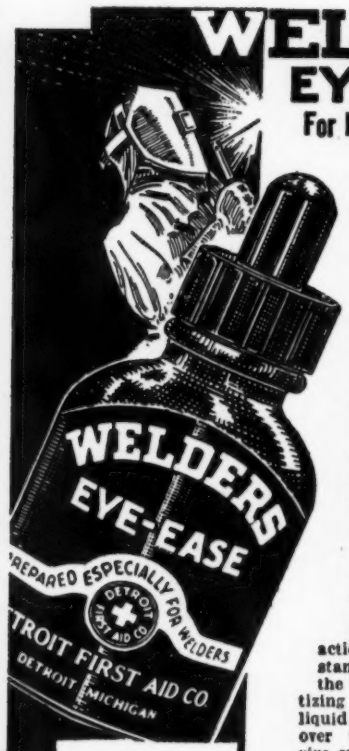

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Literature **HVC** *on Request*

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height of a relaxation phase produced by a previous injection of adrenalin. The reaction was not due to any particulate blocking of the preparation. Silica in solution produced no action whatsoever, even in amounts 10 times that used for the colloidal material, thus tending to refute the toxicity of dissolved silica.

Since control measures have failed completely to eradicate silicosis in persons exposed to silica dust, the search for a further means of control has not ended, and much recent work has given high promise of a speedy solution to the problem. Heffernan in 1932 suggested that the toxicity of freshly fractured silica lay in the fact that the silica, because of its molecular structure, presented many unsatisfied oxygen molecules to react with the body tissues. Based on this theory, a group of Canadians, Denny, Robson and Irwin (1937), felt that this toxicity could be destroyed by providing nascent hydrogen to satisfy the demand of the unsatisfied oxygen, thus rendering the quartz non-toxic.

Following this idea, Denny et al., added small quantities of aluminum to quartz suspensions and found that the solution of the quartz was almost completely prevented. Since Gye and Purdy (1924) demonstratd that the toxicity of silica was due to its solubility rather than to its mere physical presence, there was the distinct possibility that silica could be detoxified in the animal body by the simultaneous presence of aluminum. To test this hypothesis, Denny and his group exposed seven rabbits to quartz dust alone. At autopsy the six control animals presented well developed fibrosis whereas the treated animals showed practically none. These favorable results on a small number of animals led to further studies (1940) to determine the most effective concentrations of aluminum dust and whether the aluminum dust itself would produce any pathologic change. Rabbits exposed for 12 hours daily to 198 million particles of aluminum per cubic foot of air for a period of 14 months showed no significant changes in the lungs at autopsy. Thus, aluminum dust could be classed as non-toxic. Denny was able to produce silicosis in rabbits in five months by exposure for 12 hours a day. It was found that by the addition of 1.0 to 1.5% aluminum dust to quartz dust, slight fibrosis could be produced in three out of 10 animals. If the percentage of aluminum dust were increased to 1.5 to 2.0%, it afforded complete protection in all animals. It also was demonstrated that rabbits could be exposed to quartz dust for 12 hour periods and then receive 40 minutes' exposure to aluminum dust with complete protection of the animal, provided that the aluminum concentration in the lung was 0.5% greater, as compared to the amonut of silica present. The increase in efficiency in the latter series of exposures was believed to be due to the more uniform small particle size of the aluminum dust; most particles were three microns or less in size.

The exceedingly encouraging results obtained by the exposure of animals led to detailed chemical studies to determine, if possible, the mechanism by which the aluminum exerted its protective action, as well as the length of time that this protective action could be expected to last. Denny and his co-workers found that when aluminum powder was added to water, a material was formed which had the property of causing flocculation of dispersed silica particles; this material absorbed small quantities of silica and most important, was itself adsorbed onto the surface of the silica particles. Staining with aurin dye, specific for aluminum hydroxide, demonstrated that what appeared to be aluminum hydroxide had coated the silica particle. Since aluminum hydroxide is known to be practically insoluble in a pH range from 6 to 11, it was believed that the basis of its action lay in covering the silica particle with an insoluble coat of aluminum hydroxide which would prevent the silica from going into solution. Experiments have shown that this protective action still was effective at the end of 17 months. Studies made by Germer and Storks (1939), employing spectroscopy and electron diffraction patterns, have tentatively identified the aluminum compound as

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"The therapy of a majority of the cases of contact dermatitis encountered in industry", according to the noted dermatologist, Dr. Frank C. Combes[1], "requires no further medication than the intelligent use of a *good buffer solution such as Liquor Aluminum Acetate (Burow's solution)* . . . and a *good crude coal-tar paste.*"

His preference for wet dressings solution is **Domeboro Tabs** ("widely used in industry", particularly by Parkes[2] at Curtiss Wright for cutting-oil dermatitis)—because it is "a convenient tablet which, when dissolved in water, releases a *lead-free aluminum acetate in appropriate dilution,*" with a substantial percentage of boric acid.

The *crude coal-tar paste* used at New York University, according to Combes, "is manufactured commercially under the name **Daxalan**"—which has been found *superior to distillates, filtrates and pastes containing liquor picis carbonis.*

It must be properly applied for "optimum benefit", and Combes advises thinning with **Domolene** for spreading over a large area—because in his judgment its hydrophilic ointment base "does not materially lessen the therapeutic efficacy of the paste."

With tissue repair under way, and only erythema remaining, the use of **Domeboro Ointment** (each ounce of which, in a special hydrophilic base, possesses the therapeutic action of one Domeboro Tab diluted in a pint of water), permits a quicker return to work, while healing is promoted by its efficient topical action.

(1) Combes, F. C.: Indus. Med., July, 1944.
(2) Parkes, Morey: Indus. Med., January, 1944.

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a gelatinous hydrated aluminum oxide rather than aluminum hydroxide as first was believed.

Working independently of the Canadian group, Gardner, Dworski and Delahant (1944) reached similar basic conclusions, although the method of approach was different. Gardner and his group attempted to coat silica particles with an insoluble layer, thus preventing toxicity. Their first attempts to use iron hydroxide were not entirely successful and so aluminum hydroxide was chosen as a more insoluble coating. Using their own preparation of aluminum hydroxide, they were able to demonstrate a complete protection by the intravenous injection of silica in one ear of a rabbit and simultaneous injection of aluminum hydroxide into the other ear. Then began a search for a form of hydrated alumina which could be administered by inhalation, since the first hydroxide proved effective only in its original solution and could not be dried. Such a material was developed by the Aluminum Company of America and proved to be as active on intravenous injection as was the original hydroxide. Attempts to use aluminum metal as described by Denny and his group were not successful, but this was believed to be due to the fact that the aluminum powder was old and surface oxidation probably interfered.

Gardner's work is not yet complete, but he reports the following trends: Hydrated alumina in very heavy doses may produce transient reactivation of tuberculous lesions in guinea pigs. Silicosis can be completely prevented, provided the silica and the aluminum gel can be brought together in the same phagocytic cell. Immature silicotic lesions can be caused to regress, but established fibrotic lesions are rendered quiescent, while the silicotic reaction in regional lymph nodes is not affected. The use of hydrated alumina seems to possess several advantages over aluminum metal: It does not flocculate on contact with body fluids, it is stable and need not be freshly prepared and its white color is less objectionable than the black color of finely divided aluminum.

The use of aluminum powder in the treatment of silicosis has had only a very limited trial. Gardner (1944) reported several cases with rather disappointing results. Crombie, Blaisdell and MacPherson (1944) reported the results on 34 active miners with uncomplicated silicosis and measurable pulmonary disabiilty who received daily treatments of 30 minutes duration over a period of 200 to 300 days. Nineteen, or 55%, of the men so treated showed clinical improvement in that there was a decrease in cough, chest pains, shortness of breath and fatigue. Fifteen, or 45%, demonstrated no improvement, but neither was there any progression of their disease in spite of continued exposure to silica. Respiratory function has improved in 12 of the 34 cases, as shown by repeated tests. A group of nine controls, who received no aluminum therapy, showed progression of the disease in 66% of the cases while under observation. Thus it would seem that aluminum dust possesses some value as a therapeutic agent in silicosis, but its greatest value undoubtedly will lie in the prevention of silicosis in those persons not yet affected.

For many years there has been much controversy over the question of the pulmonary lesions produced by cotton dust. Most students of the subject readily admit that workers exposed to high concentrations of cotton dust present symptoms of respiratory tract irritation. In addition, the English workers discuss a febrile episode, "Monday Fever," which frequently occurs in the card and stripper rooms. Several years ago one of the authors (C. A. N.) had the experience of being called to several cities where cotton for making mattresses was being provided for the poor. The mattresses were made by old-fashioned methods and enormous quantities of dust were created in rather confined quarters. The cotton used in each case was low grade, dirty, and slightly yellow stained. In most instances it came from areas where the bolls could not mature before frost, and where the entire boll was picked and cracked and the cotton removed. This cotton often felt "sticky." Many individuals working with this cotton suffered from severe chills and fever, chest pains, cough and generalized aches and pains. The illness lasted from two or three days to four weeks, and in some instances required hospitalization. Neal and his co-workers (1942), in studying cotton obtained from these sources, were able to demonstrate the presence of a gram posi-

Few Other Foods Can Better This Nutritional Composition

Much has been learned during the recent past about the nutritional needs of the industrial worker. The importance of an adequate morning meal has gained wide recognition. That breakfast should be adequate not only calorically, but also in its content of essential nutrients, has been advocated by medical as well as nutritional authorities.

In the breakfasts recommended for the industrial worker by these authorities, cereals, ready to eat or to be cooked, occupy an important place. For there are few foods that can better the nutritional composition of the dish composed of cereal, milk, and sugar.

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tive bacillus which was capable of producing the febrile reaction. Thus it would seem that this acute febrile disease is a distinct clinical entity due to a bacterium and cannot truly be classed among the pneumoconioses.

From a wide survey of the literature, it would seem that much of the confusion regarding the toxicity of cotton dust lies in the multiplicity of etiologies. Feil (1936), in France, classed the dust as a simple organic dust which acts as a bronchial irritant and does not produce a sclerosing pulmonary lesion. Thus, emphysema and bronchial dilatation, as found in some cases, would have their origin in the coughing effort necessary to expel the irritant dust. Feil stated that the dust never reaches the alveolus proper. In this view he is opposed by Maitland (1932) and his group who stated that small particles of cotton dust are capable of reaching the alveolus and producing there an inflammatory reaction. Prausnitz (1936) noted similar changes in experimental animals, and went on to describe a marked thickening of the alveolar wall such as would occur in interstitial pneumonitis. This latter change may well account for the dyspnea and impairment of respiratory function so often described in cases presenting no demonstrable emphysema. Nor would a normal roentgenogram be surprising since such a lesion would hardly be expected to produce any visible changes.

Work by Maitland et al., Prausnitz and Brown (1929) has shown that in certain individuals there is a definite sensitivity to cotton seed protein. Prausnitz was able to demonstrate this sensitivity in all cotton workers having respiratory complaints, while those exposed to cotton dust and having no complaints showed only rare positive reactions. Maitland also reported that the protein fraction of cotton dust is toxic on parenteral injection whereas the lipoid fraction is not. This is interesting in view of the known toxicity of gossypol, which is present in cotton seed and on the fibres of yellow stained cotton and presumably in small amounts on the fibres of white cotton.

Macdonald (1934) was able to demonstrate the presence of histamine or a histamine-like substance in cotton dust. In addition, Haworth and Macdonald demonstrated an increased amount of histamine in the blood of cotton workers, and noted that this increase was most marked on Monday mornings. The latter workers then postulated that Monday fever was due to the accumulation of histamine in the lung tissues over the week-end, and that when the worker returned to work and was exposed to cotton dust again, this histamine was passed rapidly into the blood stream in large amounts due to the presence of the allergen in the lung. There is much question as to whether this is really the mechanism behind Monday fever, but it does serve to point up the allergic reactions that may occur to cotton dust.

In summation it would seem that cotton dust is capable of producing pulmonary changes, that these changes are not the fibrotic proliferation seen in silicosis but rather a diffuse fine increase in the connective tissue framework of the alveolus, and that a sensitivity to cotton dust protein must exist to serve as a causative agent for the interstitial pneumonitis. In addition, the mere presence of the dust as a bronchial irritant may, over a span of years, produce bronchial dilitation and emphysema due to repeated coughing efforts.

An outstanding example of pneumoconiosis incidental to modern industrial methods is the case of welders' siderosis. Doig and McLaughlin, in England, first reported roentgen ray changes in welders in 1936. They described a diffuse pseudonodular infiltration of the parenchyma and a marked increase in the bronchial markings and hilar shadows. There are apparently no clinical symptoms and the lesions are not debilitating. Enzer and Sander (1938) had the unique opportunity of performing an autopsy on a welder showing roentgen ray evidence of pulmonary infiltration. They described many phagocytes loaded with pigment, and also noted a tendency for perivascular and peribronchiolar concentrations of these phagocytes. There was no evidence of any connective tissue proliferation in the lung, and the opinion was that the reaction of the lung was typical of that produced by an inert dust. Chemical reactions identified the pigment material as iron, and further studies demonstrated the absence of silica in any significant quantity. A more recent paper by Sander (1944) is of interest in that one of the welders with a slight increase in trunk shadows developed minimal tuberculosis, and

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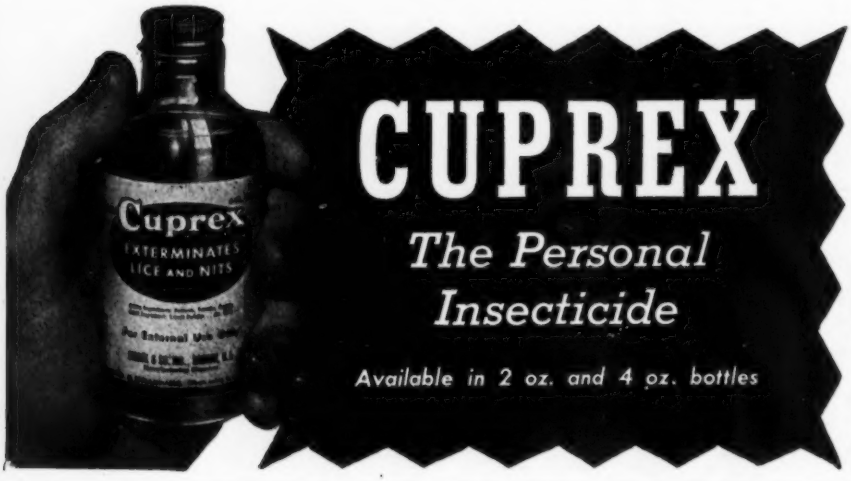

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in spite of continued exposure to welding fumes, the lesion progressed to healing without complications. Sander's further observations suggest that lung lesions may be produced in six to 10 years by excessive exposure to welding fumes, especially in confined, poorly ventilated places.

Gardner and McCrum (1942) confirmed the work of Enzer and Sander. Guinea pigs exposed to welding fume showed many phagocytes heavily loaded with pigment which proved to be magnetic iron sesquioxide. However, they were not able to demonstrate the peribronchial and perivascular infiltration described by Enzer and Sander. Gardner and McCrum confirmed the opinion of the latter workers that the roentgen ray appearance is due to the presence of iron pigment rather than to any proliferative reaction in the lung. Gardner and McCrum also demonstrated conclusively that welding fumes have no harmful effects on tuberculosis lesions, and that the fumes will not reactivate old healed lesions. Although Gardner's work was done using coated welding rods containing 20% silica, none of this material was present in the form of quartz.

While it would seem that the lesions as described are innocuous, there is the distinct possibility that some of the alloy welding rods with special coatings may not prove to be equally harmless. Some of these coatings contain considerable amounts of fluorides which are known to be highly irritating. Detailed studies using all types of coated welding rods are needed to determine whether other substances, such as silica, may occur in toxic form.

In a great many toxicological studies of dusts it has been common practice to expose animals by means of feeding, subcutaneous, intraperitoneal or intravenous injection. While such procedures may serve to determine the minimal lethal dosage in acute exposures, they also may be highly misleading. By far the great majority of industrial dust exposures are respiratory in origin and represent small doses over a period of years, presenting the picture of chronic rather than acute intoxication. Only by exposing experimental animals to dusts, in the same way that the exposures occur in industry, can a true evaluation of the toxicity of a dust be reached. The validity of this belief is shown in a paper soon to be published in which it will be demonstrated that inhaled antimony trioxide is many times as toxic as the same amount of the compound administered intraperitoneally. To prove such ideas, the authors (1944) have developed a dust exposure apparatus in which experimental animals can be exposed to varying controllable concentrations of dust in a manner similar to exposures as they occur in industry. Briefly, the apparatus consists of an air operated ejector mechanism to pick up and transport the dust, a cyclone to size the dust to three microns or less, an exposure chamber provided with openings for air sampling procedures, and an electrostatic precipitator to strip the effluent air of dust. The apparatus is placed in an air conditioned room so that temperature and humidity can be adjusted as desired. It is also possible to use forced exercise of the animals when indicated. Studies of this type cannot be done in a short period of time but require exposure of a year or more to heavy concentrations of the dust being investigated. While the length of time required for such experiments is a distinct disadvantage, the greater accuracy of the end results has led to extensive plans pointed toward investigation of dust hazards as they occur in Texas industries. One has been completed and several more are now in progress.

California Nurse Conference

THE Los Angeles and Southern California Regional Conference Industrial Nurse Groups met in Los Angeles on July 26 for the purpose of formulating plans for an all-day conference for industrial nurses, to be held in the fall. Further details of the conference will be announced later. The program will undoubtedly be of great interest not only to industrial nurses but to all those concerned with the promotion of the health and safety of workers in industry.

—*The Bulletin of the California State Nurses' Association*, August, 1945.

INDUSTRIAL HEALTH and DISEASE

Gynecology in Industry

—Causes, Treatment and Educational Program—

HANNAH PETERS, M.D., and WILSON FOOTER, M.D.,
From the Department of Obstetrics and Gynecology,
Permanente Foundation Hospitals,
Oakland and Richmond, California

FOR the last two years the Gynecology Clinic of the Permanente Foundation Hospitals has served a group of women comprising as many as 23,000 employed at one time in the shipyards in the Richmond area. Some of the problems which have presented themselves are of course common to any other type of gynecological practice. Others are accentuated and therefore summarized here.

In *Permanente Foundation Medical Bulletin*, 3: 3, 137-142, July, 1945.

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Menorrhagia

THE menorrhagia and metrorrhagia that we find so frequently when women start to do heavy work in the yards does not seem to show any correlation with the type of work they are doing. We have no evidence that hard work, or standing and walking for eight hours in itself causes prolongation or increase in the menstrual flow. The myth that the welding arc produces x-rays and might influence ovarian function has been adequately clarified. Dr. P. Drinker[1] states that welding machines all operate at 20 to 80 volts and could not produce any x-rays at all. Experiments have been conducted in industrial plants to determine whether x-rays are emitted by the welding arc. The results of several weeks' exposure of dental films carried in the pockets of welders failed to indicate even the slightest amount of exposure.[2] The welding arc has no influence on the menstrual cycle at all.

Scaling and chipping does not seem to cause any irregularity in cycle in the perfectly normal woman. Yet we hear the story daily many times over. The patient complains that her period has become prolonged and more severe since she started to work in the shipyards. The histories of these patients reveal that their periods had been regular prior to the onset of manual work, it had lasted four to five days, and the amount of bleeding had been average, necessitating three to four sanitary napkins a day. The change of the menstrual flow in its amount as well as its length seems to coincide frequently with the onset of working. Again and again we have examined these patients and have not found any organic reason for the complaint. Endometrial biopsies have been taken with the Randall suction curette.[3] They have shown in these cases two types of endometria, the persistent proliferative endometrium and hyperplasia of the endometrium. We know from the work of Novak,[4] Herrell[5] and others that bleeding from a persistent proliferative endometrium as well as from a hyperplastic endometrium might be excessive. An excess in estrogen might cause both of these pictures. Biskind and Biskind[6] have shown that the liver loses its ability to inactivate estrogen in vitamin B complex deficiency.

What happens in these women when they start to work in industry? Before they started to work they were eating a diet which at best was low in vitamin B complex. When they begin to do manual labor their caloric requirement and intake becomes greater. Their diet habits are such that the more they eat, the greater becomes their vitamin B deficiency. They are eating more and more carbohydrates which requires more vitamin B complex which they are not getting. The deficiency becomes progressively greater. The first symptom that these women notice is frequently a prolonged as well as an excessive menstrual flow.

Because of these considerations we started to use vitamin B complex in the treatment of functional menorrhagia. The results have been very encouraging. A detailed report of these cases will appear in a separate publication. By injecting vitamin B complex intramuscularly we have been able to reduce the length and the amount of flow to a normal period. In several cases we were able to follow our patients with suction biopsies, and have found that hyperplastic endometrium as well as persistent proliferative endometrium will be changed into endometrium that undergoes cyclic changes when vitamin B therapy is instituted.

The menorrhagias of the functional type are by no means the only bleeding we find in women in industry. We of course encounter all the causes for bleeding that are present in any other group of women.

Inflammatory Diseases

THE question whether or not chronic quiescent pelvic inflammatory disease might be aggravated by any type of industrial work is one that interests many physicians who deal with a group of industrial women. Dr. W. C. Bradbury and Dr. C. B. S. Evans[7] studied 135 women riveters who complained about some form of female trouble. They came to the conclusion that "pathological pelvic conditions are probably subject to aggravation in riveters." They made the statement that "riveting causes no pathological condition in the pelvis, or at least not frequently." These investigators say that they had no evidence as to the mechanism by which pathological conditions in the pelvis are upset by riveting. This is the only reference we could find which attempted to investigate a certain type of work in relation to specific gynecological conditions. To our knowledge there is no information available about the effect of climbing, heavy continuous lifting, sweeping and similar work on the chronic pelvic inflammatory diseases. There are some women who give a history of acute inflammatory disease years ago, followed by a period of freedom from symptoms, who present themselves with pain, bleeding and symptoms of an acute exacerbation after a period of heavy active work. Whether continuous climbing or heavy lifting contributes to an exacerbation, and to what degree, is entirely unknown. This question cannot be answered until a study on a sufficiently large

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group of women with such a history can be carried out. This will be done when preplacement examinations are generally accepted which will enable the examining physician to determine preexisting, but now quiescent, pelvic inflammatory disease. It is suggested that these cases be followed by regular pelvic examinations to determine the gynecological course of such a disease. By coordinating the findings and analyzing the type of work which these patients are doing we shall learn the answer to this puzzling question.

Abortion in Industry

WITH the advent of women entering industries in large numbers, one question that has been discussed by the medical profession, as well as by employers of women, has been that of abortion. Do certain types of work cause the loss of pregnancy, has been the question asked by doctors. Shall we let pregnant women work at all, is the question being asked by the employer. We know that a large percentage of pregnancies never come to term due to a defective ovum. Streeter[8] described various forms of cytoplasmic and chromosomal defects as a cause of early abortions. Certainly the type of work a woman is doing cannot be blamed if the ovum is defective. Many cases of abortions have come to our attention in the last two years. We have tried to find a cause for the abortion. In not a single case could the type of work be held responsible for the early termination of pregnancy.

Dr. Silverman[9] made an extensive study on the maternity policies in industry in 11 states. She made an effort in each instance to determine how many miscarriages had been due to work at the plant, and only one such case was reported. Among the different types of work that women are doing in the shipyards at the present time (which does not include riveting) there is not any that we believe can cause the premature termination of a pregnancy in itself.

The policy of discharging a woman as soon as it becomes known that she is pregnant is certainly a hazardous policy. Only two things can be accomplished with such a policy: (1) The woman will try to conceal her pregnancy at all times as long as possible. (2) She may try to rid herself of an undesired pregnancy if she is certain or afraid that the detection of her state may mean the loss of her job. The desire to conceal her pregnancy will prevent the woman worker from securing adequate prenatal care. The importance of prenatal care for women on the job, as well as for those who are not working, is too well recognized to be discussed further. Two suggestions are made to try to control abortion among a group of women employed in industry:

I. A sound maternity policy as suggested by Dr. Silverman.

(a) Avoidance of penalizing regulations so that women will be encouraged to report their pregnancies as early as possible.

(b) A health evaluation of every case. Such findings and not pregnancy itself should form the basis for any decision regarding the continued employment of a woman who becomes pregnant.

(c) A job evaluation of every case.

(d) Periodic physical examination.

(e) Reasonable and protective minimum prenatal and postnatal leave periods.

II. A conception control program available to women workers.

Medical Educational Program

CANCER Detection Clinic.[10] Cancer is the most serious condition encountered among women in the working-age group. It is the only condition which, if untreated, is 100% fatal. Cancer of the ovaries, uterus, and the cervix amounted to 0.9% of all the new cases in the Department of Gynecology and Obstetrics of the Permanente Foundation Hospitals. This percentage has remained the same for a two-year period, though this is about twice as high as the usually reported figure.[11]

Our approach to the situation has been two-fold. First we have tried to find and utilize the best means of diagnosis. In this way we have demonstrated that extremely early cancer of the cervix can be consistently detected and not stumbled upon accidentally. Each patient entering the clinic for any complaint whatsoever is examined with a specific aim toward ruling out the existence of cancer of the reproductive organs. Each patient has an examination of the breasts. Pelvic examination includes careful observation of the cervix and the application of Lugol's solution. This Schiller test is one of the most valuable and the most neglected in medicine. Otherwise non-suspicious areas are made to stand out in such prominence after the application of

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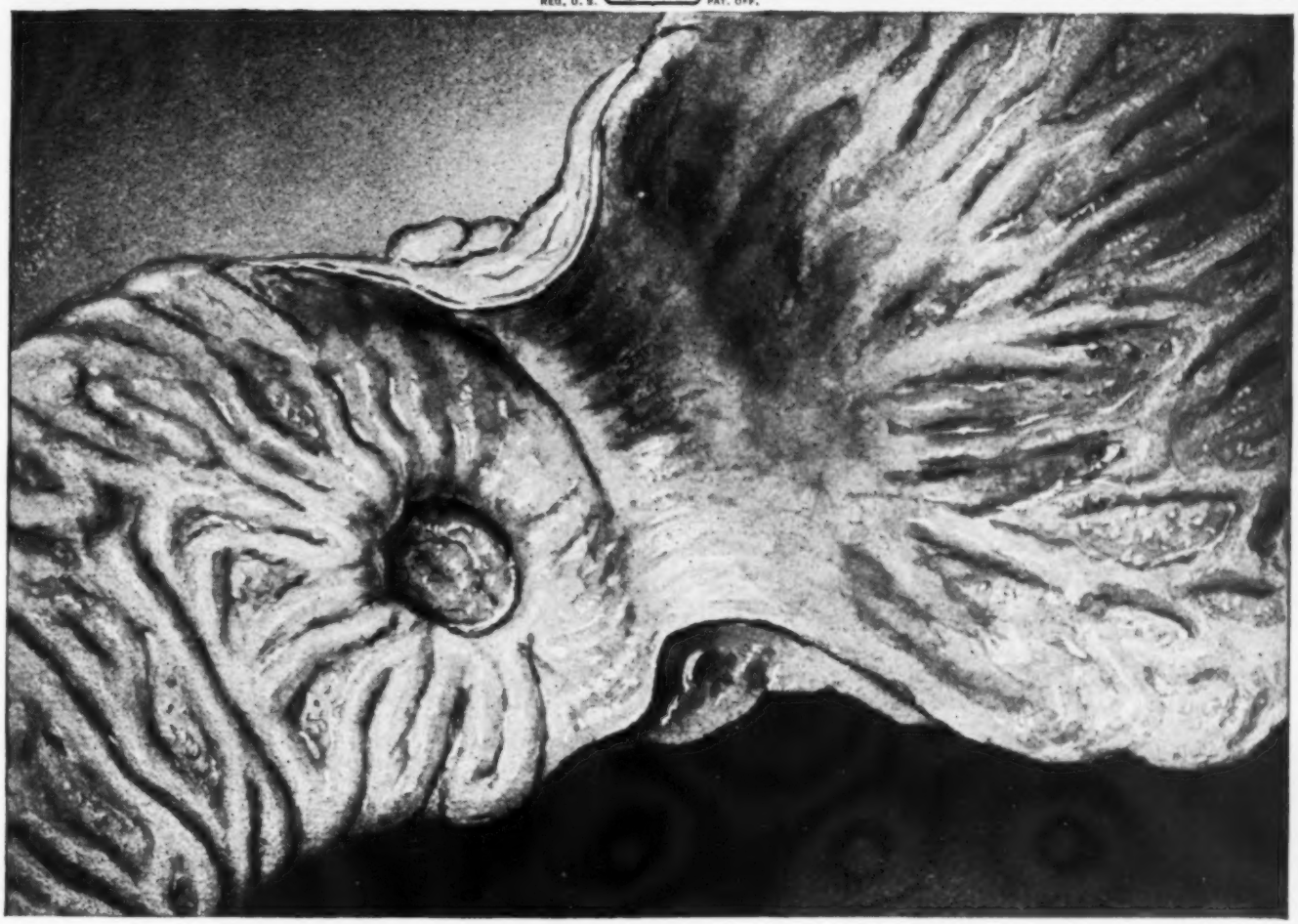

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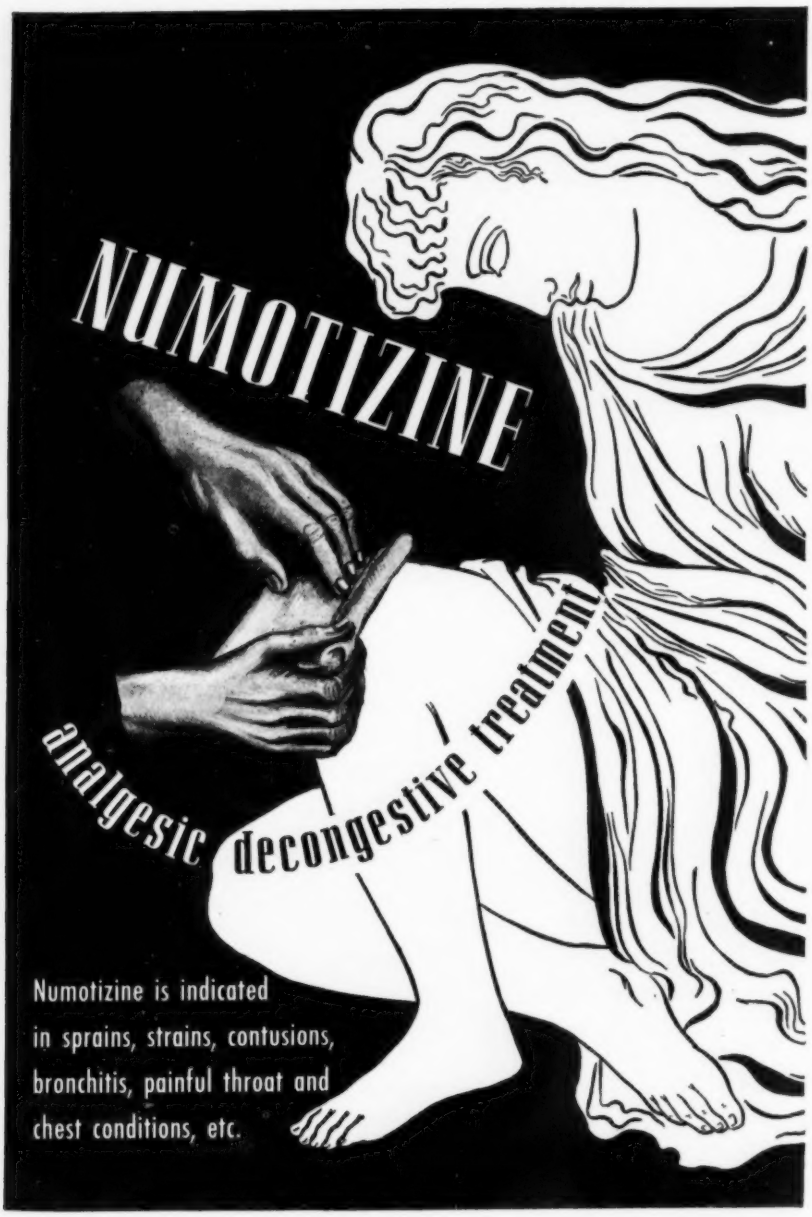

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the iodine solution that the site for a punch biopsy is easily chosen. Our results have been startling, but they only substantiate the statistics of Schiller.[12] Aspiration of secretion taken directly from the cervix and stained with hematoxylin and eosin has been of great assistance in establishing the diagnosis in several very early cases of epidermoid carcinoma of the cervix. However, many advanced carcinomas appear not to shed characteristic cells and as a result these smears are negative.

Aside from a purely medical approach we have attempted to disseminate information to the patient to the effect that a physical examination should be had every six months, and that any symptoms arising in the interval should be investigated promptly. So far the program has been quite limited and the results cannot yet be evaluated.

Venereal Disease Education. In the period between March 1, 1944, and February 28, 1945, 2832 new cases were seen in the Gynecology Department of the Permanente Field Hospital in Richmond alone. Among these, there were 390 cases of gonorrhea. This means that 13% of all new gynecological cases proved to be infected with gonorrhea. This is a significant number. The gynecology clinic is not particularly known as a venereal disease clinic, but handles all patients that come in for any sort of "female disorder" and general "check-ups." These 390 cases include only those proved bacteriologically.

The incidence of venereal disease during the war period is particularly high. Dr. P. S. Pelouze[13] calls attention to the fact that where venereal disease is reported to the local health authorities by the armed forces, from seven to 10 cases of gonorrhea are reported to every new case of syphilis. The high percentage of infected women, most of whom were discovered incidentally during examination for other complaints, led us to introduce an educational program that was carried out in the yards. The importance of such an educational program has been pointed out many times. The Surgeon General of the U. S. Public Health Service[14] advocated such a program. Dr. R. Koch[15] developed a plant educational program.

Venereal disease educational material was placed in all women's rest rooms in the yards. Literature supplied by the Public Health Department, was made easily available in wooden racks which were hung in conspicuous places in every women's rest room. We were encouraged to find how quickly the literature disappeared. We know that the pamphlets were not only taken out of the rack, but they were actually read. We cannot measure their educational value; however, innumerable women have come into the clinic asking to be examined for a venereal disease because they think they might have some of the symptoms described in the literature.

Education of the patient is only part of the program. As in the case of cancer, the actual case finding is one of the most important steps in controlling disease. The text book picture of acute gonorrhea does not present any problem. The woman who presents herself with acute vaginal discharge accompanied by frequency and burning on urination and with a history of exposure a few days prior to the onset of these symptoms, will not be misdiagnosed. However, gonorrhea, acute or chronic, can hide itself behind so many varied complaints that in some cases it is hard to make the diagnosis of gonorrhea on the history and physical findings alone. We have learned to suspect gonorrhea in patients with varied histories. The most frequent picture, outside of the typical text book story, is the one in which the woman tells us that she had a normal menstrual period which ended two weeks or even only a few days before a new period started. Smears and cultures taken in these cases will often prove a gonococcal infection to be present. Many problems of so-called "functional menorrhagia" have been solved when smears and cultures were taken. We would like to point out that it is of great help to take smears and cultures even when a woman is bleeding. Many physicians believe bacteriologic studies at that time to be inadequate. It has been our experience that smears and cultures from a bleeding cervix can be adequately read and have proven to be of great value.

Summary

It is suggested that a certain type of functional menorrhagia can be adequately treated with vitamin B complex.

2. Organized research is necessary to settle the question whether and

ARE INDUSTRIAL WORKERS *Different?*

In recent years, with the great influx of women and older male workers into factories, several heretofore nonexistent problems have been created. Among these is the need for dietary adjustment. Persons whose caloric expenditure in the past was not great, now are required to work physically for eight or more hours, thus markedly increasing their caloric needs as well as their requirement for certain vitamins. Unless proper measures are taken, full efficiency cannot be attained.

Through the use of Ovaltine, the nutritional value of the diet can be substantially increased. This delicious food drink, made with milk as directed, provides a wealth of essential nutrients, all of which contribute to greater stamina and lessen the incidence of fatigue. Many industrial surgeons have found it profitable to recommend three glassfuls of Ovaltine daily, and to offer Ovaltine at plant eating establishments as a means toward augmenting the nutritional intake. Served hot or cold, Ovaltine is readily taken by workers, both as a beverage at mealtime and as a between-meal snack.

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to what extent pre-existing pelvic inflammatory disease is influenced by manual labor.

3. A cancer detection clinic is discussed.

4. Thirteen per cent of all new gynecological cases were found to be infected with gonorrhea. A venereal disease educational program for women is described. The importance of bacteriological studies at all times for purposes of case finding is stressed.

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The Dynamics of Mental Hygiene in Industry

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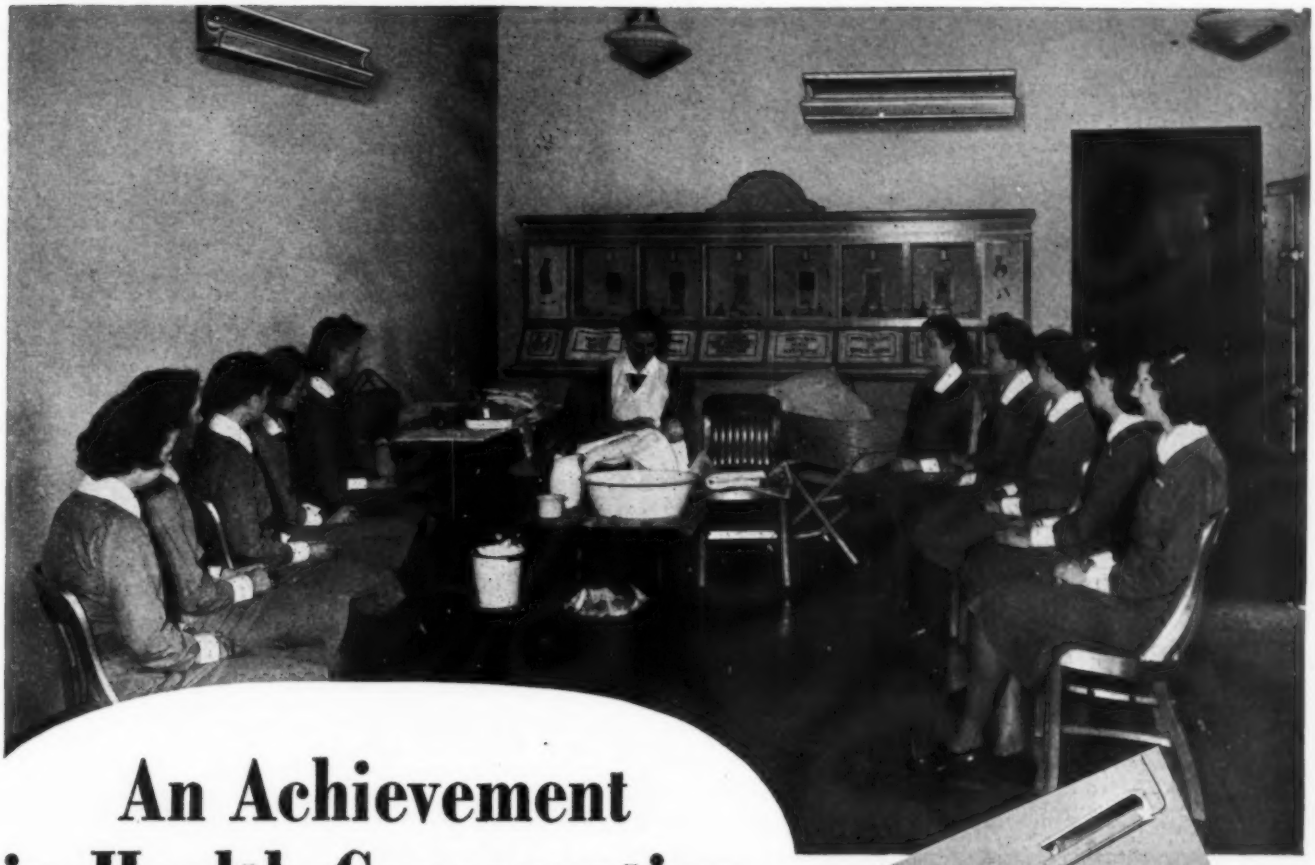
INDUSTRIAL psychiatry is a fledgling clumsily trying its wings. William Alanson White predicted a brilliant future for this proposed discipline in his *Twentieth Century Psychiatry.* Yet Elton Mayo, in his *Human Factors in an Industrial Civilization,* a book based mainly upon the important experiments at the Hawthorne Works of the Western Electric Company, repudiated the necessity for psychiatrists in industry, despite the fact that he leaned heavily upon psychiatric formulations and used a psychiatric approach. He feels that the human problems encountered in the plant are not "mental disorders," and that they can be dealt with adequately by foremen, personnel worker, and employment interviewer.

This characterization of the psychiatrist as only a "nut doctor" prevails in many quarters, although the stress of recent events has caused industry to turn more and more to psychiatry for aid in the solution of some of its problems. Industry can profit from psychiatric knowledge and experience, but psychiatry, before it can teach, must be aware of the problems and aims of industry.

From *Mental Hygiene*, 29:3, 371-385, July, 1945.

The present war, with its all-out effort, has brought the problem of psychiatric disorders to the fore. One and a half million veterans have already been discharged from the armed forces, 30% of them, according to military statistics, for neuropsychiatric conditions. This vast number has brought dismay and fear to those obliged to employ them. Many employers have apparently confused the term "psychoneurotic" with "psychotic," and seem to anticipate that a veteran with a psychoneurotic condition, if let loose in a plant, will throw a monkey wrench into the first available machine. The armed forces have attempted to allay this apprehension by omitting the diagnosis from the discharge certificate. As far as I can see, this aggravates matters, since things concealed assume an even more dreadful aspect. Industry has always been faced with the problem of the maladjusted individual, but he was not labeled with a fancy diagnosis and so no one was afraid of him.

Selective Service figures give us some indication of the prevalence of emotional disorders in the community. Of the first 10,000,000 registrants screened, 2,800,000 were classified 4-F. Of these, almost 900,000 or roughly



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one-third, were so classified for various neuropsychiatric and psychosomatic conditions. The group examined, aged 18 to 38, is presumably in the prime of health. Should this rate apply to the rest of the population, then at least 11,000,000 persons have a neuropsychiatric condition sufficiently severe to be manifest in a single short examination. If you have read Stanley Cobb's excellent monograph, *Borderlands of Psychiatry*, you will find these figures confirmed from another aproach.

These figures are enormous and indicate a problem about which shockingly little is being done. Those of us, however, who have had the pleasure of participating in Army Induction Board examinations can testify not only to the large numbers so affected, but more surprisingly to the large numbers of psychiatrically handicapped individuals who are managing to adjust themselves to everyday life, working and discharging their obligations as useful citizens, although at a cost to their personal comfort.

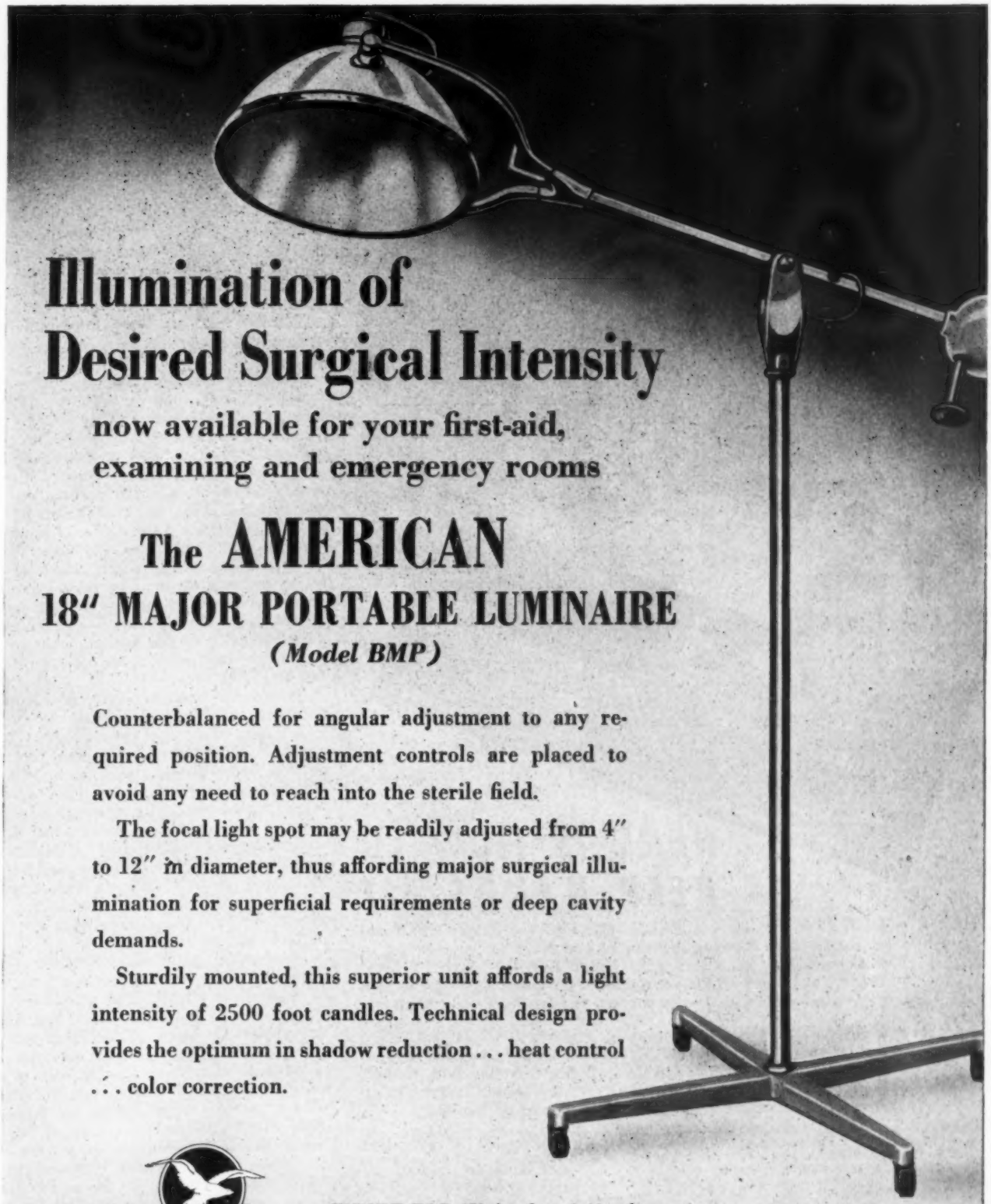
There is no question as to whether industry can utilize psychiatrically handicapped individuals. Industry has been doing it, often without realizing it, and perhaps not as efficiently as it might. Attention has been drawn to the fact that certain undesirable industrial traits, such as absenteeism, frequent job changes, poor work habits, prolonged invalidism, and accident-proneness, may in large measure be due to emotional factors. Yet, if industry were at this moment to discharge every one with a psychiatric disorder, not only would all the psychiatrists in private practice in this assembly have to go on relief, but industry would find itself seriously handicapped. Every psychiatrist here can testify that some of their sick people are doing fine jobs in labor, industry, the arts, and sciences.

We should remember, however, that the responsibility for the treatment of these disorders is up to the individual and the community. Industry, even in Russia, is run for profit. Industry can never be run for the sole purpose of occupational therapy. The major problems that psychiatry has to aid industry solve are: (1) to devise means of separating the wheat from the chaff, the large numbers of employables from the small numbers of unemployables; and (2) to improve methods of job placement and handling of the emotionally handicapped.

Theoretically, I suppose, it would be a fine thing if every plant in this country would utilize the services of a psychiatrist. From the practical point of view, it is impossible and perhaps unnecessary. There are only about three thousand members of the American Psychiatric Association, so that there are not enough psychiatrists to go around. Further, 65% of the people working in this country work in plants employing fewer than 500 persons. Such a plant cannot afford a full-time medical man, much less a psychiatrist. Those who would propose the use of complicated screening tests for prospective employees must bear in mind that in smaller organizations specialists will not be available for the administration or the interpretation of such tests. Even in larger plants it is hardly to be expected that psychiatrists will be used instead of placement officers or supervisors. The psychiatrist will be of greatest use by acting in an advisory and consulting capacity to the medical staff, the personnel department, and indirectly to the supervisory personnel.

A word about the responsibilities of a psychiatrist in industry. It is that of any industrial physician, except that it is along the special lines for which his training has equipped him. The industrial physician has three main functions: (1) to assist in the placement of applicants for employment; (2) to treat any medical emergency that occurs among the employees while at work, and any condition that arises out of working conditions; and (3) to initiate any program that will prevent or diminish mental and physical illness.

In brief, as in the army, he is responsible for keeping as many people at work as possible.



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The Psychiatrist and Placement—There are important differences between the mental and physical requirements of the armed forces and of industry. The armed forces obligate themselves to treat almost any condition that arises while the man is in uniform. This may entail prolonged hospitalization, the utilization of expensive equipment and skilled man power, often evacuation over distances that may cover half the globe, and pensions for permanent disabilities. Also, the fighting man must be capable of withstanding tremendous physical and mental strains, including the threat of death. Industry makes no such demands, and assumes none of these obligations. It is quite obvious, then, that entirely different criteria for employability are needed in industry.

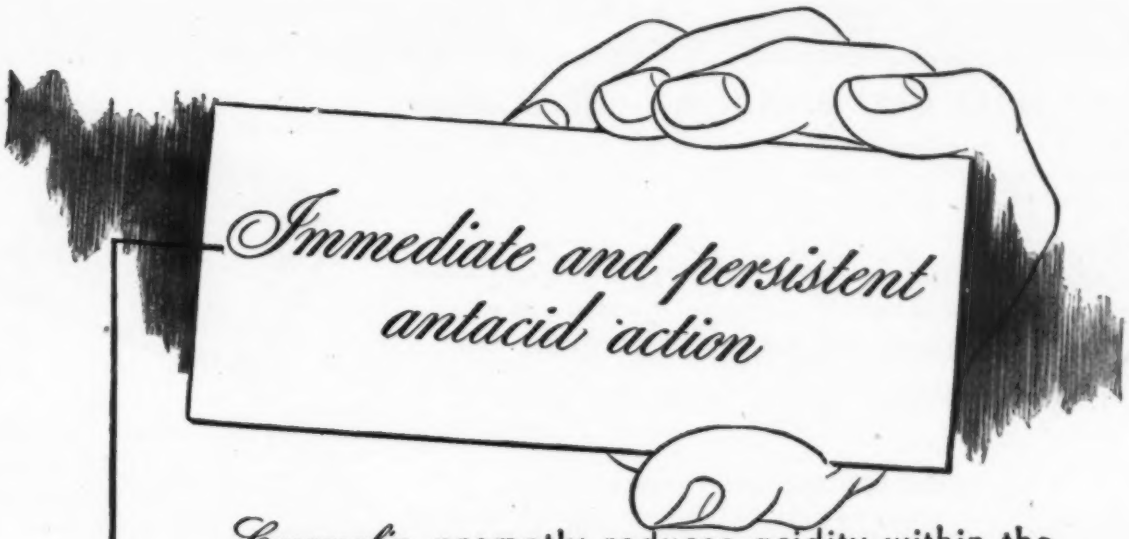
When labor is plentiful, the industrial physician can ease things for himself and his company by a rigid system of selection of employees. During the present emergency, however, with the shortage of manpower, his ability to select is sharply curtailed, and he must utilize the residue left by the armed forces. One can only hope that the end of the war will find the labor market still "tight," because while a labor oversupply may make personnel selection easier, it does so at the cost of tremendous economic waste, the burden of which must be borne by the community and indirectly by industry.

Before the psychiatrist can offer advice as to the employability of an individual, he should understand something of industrial-placement procedure. Often enough, when a worker with a neuropsychiatric defect is referred to the specialist, a lengthy report is returned which includes a well-thought-out diagnosis. But the poor plant manager hasn't the vaguest idea what to do with it, because the essential questions as to whether, where, or how the man can be employed are not answered.

In a small plant the question of placement, of matching the applicant to the job, is simple. The proprietor knows every job in the plant, and a little about the personalities involved. It is relatively easy for him to know in advance that John Doe will fit in and can do the job in question. When plants become larger, types of jobs more numerous, and the question of interpersonal relationship more complex, then the employment interviewer finds himself almost in the position of placing a man he has just met into a job he does not know, to get along with personalities he knows only by a serial number. To counteract this, comparatively complicated placement procedures have evolved that are making personnel work a profession. But the problem still resolves itself into sizing up the job, sizing up the applicant, and matching them.

Each job has certain requirements, or demands. These are:

1. *The physical demands of the job and its environment.* The U. S. Em-



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ployment Service of the War Manpower Commission has worked out a careful job-analysis scheme. As jobs become more specialized, fewer physical requirements are demanded. These requirements are specifically stated, both for the job itself and for the working conditions. From 20 to 30 different items are included under physical activities (such as walking, balancing, sitting, handling, fingering, seeing, hearing, depth perception, and so forth) and a similar number under working conditions (as inside or outside, hot, cold, dry, noisy, dusty, hazardous, working with others, and so forth). A surprising number of jobs will be found that will require but one arm, no vision, or no hearing, and so on.

2. *The intellectual demands of the job.* This requires only a rough approximation which can be determined by finding out roughly the intellectual level of those best performing a certain job. It is as much a mistake to place too bright an individual as too dull a one on a job. The bright one becomes bored, careless, and indifferent. The excessively dull may seek any of the compromises and escapes known to psychiatry to preserve his ego rather than acknowledge his inferiority.

We had one veteran, a parachutist discharged for a back injury, whose mental age was nine. We recognized this and thought we had a relatively simple job for him in the packing department. Within a few days we were told that his conduct was bizarre. Upon investigation, we discovered that what we had considered a simple job involved packing 25 different items in 15 different packages as well as the operation of a stitching machine. It was far beyond his capability, and the escape he chose was a psychotic one. Our error was based upon a faulty evaluation of the intellectual demands of that job.

3. *The technical demands of a job.* The best judge of this is the supervisor, who can also determine whether the applicant has the necessary experience and skill. This applies especially to the more highly skilled jobs. I would no more attempt to decide whether or not a man is a good tool-and-die worker than I would expect a hospital steward to choose a clinical director or a pathologist.

4. *Intangible factors.* These include the emotional demands of a job. We confess our inability to determine all of these factors. We know of no way of doing a Rorschach on a job. We are doing the best we can. If we knew all the answers, we would know why some people make good policemen and others good barbers. We would not hesitate to employ an effeminate individual as an illustrator or in certain types of clerical positions. We would refrain from putting him into the foundry. We have found that we cannot place persons with perfectionistic tendencies in certain departments in our concern, but we are not certain of the reason. An interesting illustration is the experience of the British Army. One would suppose that the person best suited to drive a tank would be one with previous mechanical and driving experience. Yet cab drivers did poorly in tanks. Apparently the taxi drivers were accustomed, all of their lives, to stay in line and avoid collision. The tank requires a crashing, destructive tendency which has been trained out of cab drivers. It is these intangible factors that make an ideally complete job analysis difficult.

The job analyst is responsible for compiling these job requirements for each job, and the results are compiled in a manual accessible in the employment office. What has been done with the job must now be done with the prospective employee. This is done by the employment interviewer with the aid of the medical department and various specialists, including a neuropsychiatrist. The individual is studied to discover what his capacities are, and the outline follows that of the job requirements. These are:

1. *Physical assets.* The interviewer is furnished with a comprehensive medical diagnosis from which he determines what the applicant's physical assets are. The interviewer's attitude is a positive one. If a man is deaf, he can still walk, finger, employ a known amount of depth perception and so on. As a matter of fact, he is at an advantage in a noisy environment. Using this type of approach and attitude, the placement of the physically handicapped is a comparatively simple proposition. Where difficulties are encountered, one can presume that emotional complications are interfering.

2. *Intellectual assets.* In this part of the country, where schooling is universal, the applicant's rate of progress in school is usually a suffi-

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ciently satisfactory index of his intelligence. Where required, brief psychometric examinations may be performed. We believe that too great an attempt at accuracy in this regard with all employees is unnecessary and involves an excessive expense.

3. *Technical skills and experience.* These are brought to the attention of the prospective supervisor, who is the final judge.

4. *Emotional assets.* We use this term deliberately because we have found to our dismay that psychiatric diagnoses by themselves are not the sole criteria in placement. Ordinarily one would presume that the psychotic is universally unemployable. This is not entirely true. Two illustrations will be instructive.

I have in private practice a former pugilist who is punch drunk (post-traumatic Parkinsonism). For the past 15 years he has been suffering from a paranoid condition. At the beginning, he discovered, to his dismay, that he was impotent with his girl friend. He watched her carefully, but could never catch her putting into his beverages the drug that he was sure was causing the condition. At times, when he turned suddenly, he could see rivals lurking in the shadows. In self-defense, he broke off with her. Since then people have been trailing him in the subways and emit foul odors to disturb him. His only explanation is that he must have slighted some one in the past, and so this man and his family have tormented him since. During this entire period of at least 15 years, he has been working steadily. In the past four years he has been employed in a war plant cutting steel. I understand that his work is satisfactory.

One more illustration. While being visited at Sperry by the psychiatric consultant of the Office of Vocational Rehabilitation, I examined a veteran. Although neatly dressed, his speech and thought were so disorganized, and his affect so flattened, that I asked him if he would return with a member of his family. His father was in the waiting room with him. We learned that he had been discharged from a state hospital five years before. A little over three years ago, he enlisted in the marines, and served two and a half months, just long enough to be recognized as a deteriorated praecox and discharged. Since then he had been steadily employed elsewhere as a machinist, earning $90 a week. He had never missed any time from work, had saved his money, and had never been in any difficulty. We confirmed this story and employed him as a machinist, and so far he is doing well, although his colleagues consider him queer.

On the other hand, we had a former Sperry employee who served 11 days in the navy. Prior to his induction, his supervisors were having increasing difficulty with him. Because of his seniority, and because he was due to be drafted, he was tolerated in order to protect his military-leave bonus. Upon his return, however, he objected to the routine re-examination procedure, and in particular to the vision test. He was brought to another plant to have the vision test repeated. The oculist felt that he was having difficulty in passing the test for emotional reasons. His attitude was so bizarre in the employment office that he was asked to see me. He was mildly paranoid, but his trends were directed against the company and the supervisors. Because of his veteran's status, and our legal and moral obligation, he was reinstated in his former position, with the understanding that he was to see me regularly. He soon developed trends against his machine. His work fell off, and the problem of supervision became insolvable. I prevailed upon him, I thought, to take a medical leave of absence in order to enter an institution for treatment. Apparently he changed his mind and notified the Selective Service System that we had given him a medical leave rather than a release only to prevent him from working elsewhere. We had to dismiss him.

I chose these three cases deliberately, not so much to demonstrate that schizophrenics are occasionally employable—as indeed they rarely are—but to show that a psychiatric diagnosis by itself is of little use in industry. These three men suffered from like conditions; two of them, one deteriorated, are employable; the third, and probably the least sick, proved unmanageable. This holds true for every psychiatric classification, although with the psychoneurotics, the percentage of unemployables is smaller.

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ment interviewers that they can almost disregard any history of a nervous breakdown. We have told them that, as a matter of fact, certain types of psychiatric liabilities, such as obsessiveness, perfectionistic traits, and so on, if properly channelized, may constitute industrial assets. We object to an exclusively cross-sectional view of an applicant and demand that he be viewed from the longitudinal point of view. Consequently we feel that the employment interview, properly conducted, constitutes the best guide as to placement, although we are experimenting with group Rorschachs, and so on.

The employment interviewer is instructed to adopt the neutral attitude and to permit the applicant to tell his own story as much as possible. In valuation, emphasis is placed upon his previous work history, and his previous school history. If he is a veteran, his army record is examined for evidence of leadership shown, and special skills learned. We are interested in the attitudes he has shown to persons in authority. We are interested in evidence of maturity and responsibility as shown by his marital status, his savings, and his attempt to establish a home. What his attitudes are to himself and to any defect present are also noted. If he is a veteran, the length of time it has taken him to apply for a job is significant. Generally speaking, the sooner a veteran wants to begin work, the better his prospects. The veteran who has to rest at home, for vague reasons, is often a psychoneurotic who lacks insight and is fleeing from his problems. On the other hand, the veteran who states that his nerves were shot and so he did not want to work, but that now he feels better, at least has some insight and is making an attempt to face his difficulties. Should there be any question, the employment interviewer is free to request a psychiatric consultation. This serves a double purpose. First, specific advice is given on the problem. Second, the discussion that follows the consultation points out the factors involved and aids the interviewer in his orientation.

All the above must seem like a cumbersome process, but actually it works out quite smoothly. When a former employee applies for reinstatement after discharge from the armed forces, the problem is much simpler. We know what he has done in the past. Also, the applicant knows what the job was, and the mere fact that he is reapplying shows that he was happy with the former placement. When the former job is no longer present, or when the physical or mental status of the applicant has so changed that he is not the same person as he was previously, it is necessary to make a new placement.

The applicant who is referred to me for evaluation is told that he is being referred to a psychiatrist in order to achieve a more suitable placement. The suggestion made by some that the industrial psychiatrist ought to mask his identity under some other description such as plant physician, and so forth, smells to me like chicanery and intellectual dishonesty, the result of personal feelings of inadequacy. I have found no resentment in any one referred to me. On the contrary, a few veterans have complained that they have not been "psyched" and do not want to be left out. The employee is under no compulsion, and what he reveals is considered confidential except for the brief report sent. Not a few have requested further interviews.

So far as employment prognosis is concerned, I rely chiefly upon an evaluation of the *previous work record.* Where a neuropsychiatric condition is present, consideration is given to acuteness of onset, severity of precipitating factors, previous personality, duration of illness, adequacy of treatment, presence of affective features, whether or not improvement is continuing, presence of some degree of insight, and what the motivations are that determined the man's return to work. The presence of antisocial trends generally precludes employment. Accident-proneness is considered a bar to employment. Psychopaths may be employed if they can be without expenditure of money for training. Epileptics may be employed in certain sheltered situations, if they have an aura, are under treatment, and are capable of handling themselves in case of a fit.

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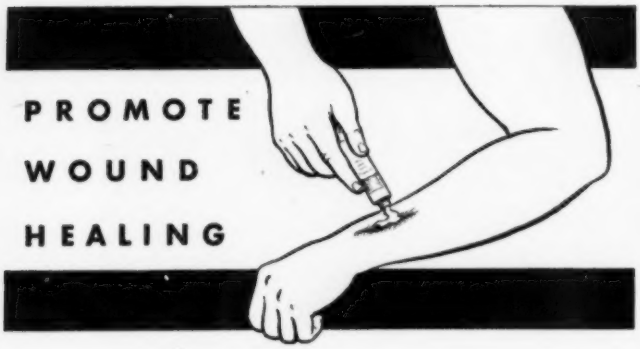

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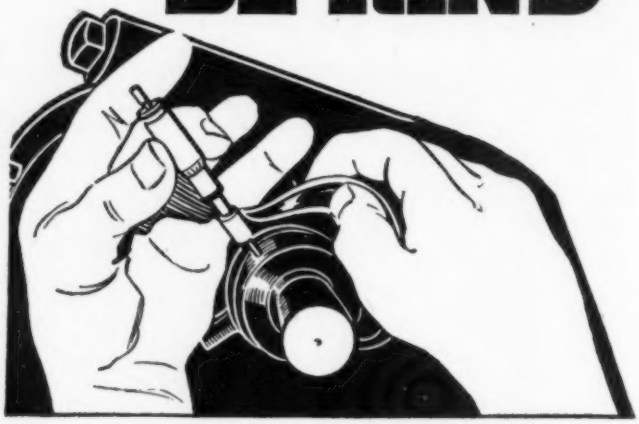

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In a few instances veterans have returned prematurely, but examination indicated that they were improving and would be ready for work at a later date. These veterans were so informed. Some of these were given stop-gap jobs until they were ready to return to their former jobs.

After placement, a follow-up is maintained by the employment interviewer, the supervisor, and, in the case of veterans, by a veterans' counselor. If for any reason the placement appears poor, reassignment or other adjustments are made. This attitude that mistakes will be made enables all concerned to learn from mistakes.

The Psychiatrist and Supervision—The crux of any rehabilitation program, after placement, is the supervisory personnel. The supervisor sets the morale of the department, and can make or break any rehabilitation program. Apprehensions arising from misconceptions of the psychoneurotic concern him. He must get out production and fears any one labeled as a "nut." To allay these fears, we have been addressing foremen on the subject of psychoneuroses, mainly for the purpose of reassurance. In addition, educational slide films are being prepared. Technical terms are avoided. We assure them that the problems they will face with the returning veteran are no different from those they handled previously. They are given simple and sensible instructions. Where a problem gets beyond them, the personnel department is available for help, as is the veterans' counselor, the medical department, and the psychiatrist.

In the lectures, anxiety is explained. They are told that in most instances the conflict is resolved by discharge from the service. They are warned that curious questioning and unskilled probing may rub the wrong way. Griping is explained as being due to a combination of two variables—the manifest content and the latent. The manifest content must be investigated. The latent content is due to emotional factors not necessarily connected with work and is often benefited merely by permitting the employee to blow off steam. They are told that psychotic states are rare. They are warned of the guilt feelings that follow discharge and of the necessity of rebuilding a new group spirit quickly. The emotional adjustments and reorientation that must be made by the veteran when he returns to his home and to work are explained. Supervisors are enjoined to be patient. They are told that it takes a year of military training to make a soldier out of a civilian, and that it will take a period of "peace-time training" to readjust him to civilian life. The placement program is fully explained. These lectures have found an enthusiastic reception.

Psychotherapy in Industry—The lectures and consulting service have resulted in a valuable educational program that has benefited the medical department, the personnel department, and the supervisory personnel, affording them a valuable insight that has enabled them to recognize emotional problems at the beginning. The simpler problems thus have been resolved more readily. No formal psychotherapy has been attempted, although of course one cannot conduct a psychiatric interview without giving some aid and comfort. Where psychotherapy was deemed advisable, the patient was referred to a private physician or an outside agency. We hope that the facilities available for psychotherapy in the community will be expanded after the war. So far as veterans are concerned, there are a few clinics doing a commendable job, but they are swamped by appeals for help. I hope that the Veterans Administration will be able to offer out-patient psychiatric care. The firm that I represent has arrangements with a private sanitarium by means of which we can handle those of our employees who require a short period of institutionalization under our group-hospitalization plan.

The ability of an employee to let off steam by griping and an understanding on the part of the supervisors of the nature of griping provide a helpful release of emotional tension, and often uncover employ-

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ment situations that require correction. The filing of grievances is a more formal step in the same direction. The suggestion system offers an opportunity to make positive contributions to the company, and the labor-management committees give both parties an opportunity to understand seemingly contradictory points of view, which around the conference table do not turn out to be quite so contradictory.

Psychiatric Emergencies—The psychiatric conditions encountered among employees are as varied as those seen in private practice. One girl was hospitalized during a minor infantile-paralysis epidemic, complaining of inability to open her left hand. Sodium pentothal narco-analysis uncovered an emotionally starved family background, with the present situation precipitated by rejection by her love object, coupled with marked feelings of guilt over what the hand had held, which she was unconsciously unwilling to release.

A less favorable outcome was achieved in another situation. A 54 year old white male had taken to drink after the death of his wife, apparently in a blind attempt to repress incestuous desires toward his daughter. When I saw him, he was in a state of pathological intoxication coupled with a paranoid trend. He was committed. Within a week, however, after the effects of alcohol had worn off, he was able to talk himself out of the institution. When I saw him again, his sensorium was clear, but he presented a well-systematized delusional system involving his daughter's morals, so cleverly constructed that his friends were convinced. Despite warnings to the daughter, she made no further attempt to commit him. Of course we would not permit him back at work. A few weeks later he made a murderous attempt to stab his daughter.

CONCLUSION: The exigencies of war are bringing industrial psychiatric problems to our attention. Mental hygiene in industry must utilize as much as possible facilities already present in industry. Psychiatrists can contribute much to proper placement and better labor-management relationship by an educational program, and by acting in a consultant capacity. This program should attempt to improve the employment interview, methods of placement, and supervision. Aside from the financial savings inherent in such a program, which we feel are considerable, the saving in human values is inestimable. Enlightened management, which looks upon good labor-management relationship as important not only to the community, but, financially, to the company as well, will be quick to inaugurate such programs.

Industrial Health

—Many Small Plants in Queens are Cooperating in Plan to Establish Part Time Medical Service Program—

DR. H. P. MENCKEN, M.D.,
Chairman of the Chamber's Public Health Committee

EVERY industrial concern, regardless of size, derives benefit from the operation of a good medical program among its personnel. For one thing, such a program reduces the expense of accident or illness both to the company and to the individual worker. It reduces compensation costs and cuts down lost time accident cases. Absences and labor turnover are lessened. A medical program helps to properly place handicapped individuals, especially veterans, in jobs they can safely perform. It helps to improve the healthfulness of the working environment in the plant. It renders advice concerning various health problems including fatigue, worry, proper food, etc. All of these factors build good will for the company.

Practically all really large plants have medical service. Here in Queens, however, the problem is how to make the benefits of a medical program available to small plants which do not need the full time services of a doctor or nurse. The obvious answer, of course, is part time service in these plants.

Through the cooperation of the Medical Society, nursing organizations, and the Health and Labor Departments, such a part time medical service has been made available, backed also by the Chamber of Commerce and labor unions. It is something the small plants in Queens

In *Queensborough*, May, 1945, published by the Chamber of Commerce of the Borough of Queens.

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really need, as a recent survey of a group of 100 small plants showed that only 10% had any kind of plant health service at all.

In order to show how the small plant could establish proper health service, a demonstration program was designed which was limited to a small group of representative plants. In these concerns, which were similar in every way to other small Queens plants, there were either no plant health programs or very poor ones. The Office of Industrial Health, an organization combining the regular facilities of the New York City Department of Health and the New York State Labor Department, offered special services to these plants consisting essentially of nurse, chest x-rays, records and educational material. The plants hired their own physicians and set up their own plant medical departments, with guidance by the Office of Industrial Health.

Seven concerns, ranging in number of employees from 75 to 700, are participating in the demonstration program. A wide variety of types of business is included: food, chemical, machining, etc. The smallest medical office is 80 square feet; the largest is 600 square feet. The doctors devote as little as three hours per week to the smallest plant in the program to 20 hours per week in the largest. The nurses give from seven hours a week in the smallest plant to 40 in the largest.

The medical department's regular activities are more varied than most people realize. Pre-placement examinations are given new employees, as well as routine physical check-ups periodically for all employees. Anyone injured or becoming ill while on the job reports to the medical office for first aid. Complete records are kept on all examinations, lost time due to accidents and illness, first aid and advice given, etc. The medical department also acts as a source of health information, through its use of visual aids is health promotion, and through the service it renders to those who seek advice on some health problem. At frequent intervals, too, the doctor and nurse go into the plant, inspecting the conditions under which work is carried on. To aid in the dissemination of health information and the promotion of safe and healthful conditions in the plant, a labor-management committee on health and safety meets with the doctor regularly to exchange information on plant problems and to make plans for meeting those problems.

The procedures for establishing a medical department are known and tested. The cost of equipping and staffing it is not great. With the most important factor, an interested and cooperative management, setting up a medical department in a small plant is simple. Further details can be obtained from the Chamber of Commerce or from the Office of Industrial Health.

COMMENT and OPINION

—Continued from page 36.

Union Health Committee

ON THE basis of comparative studies of voluntary health plans in California, the Union Health Committee has found that the Permanente Plan offers workers more and better medical services for their money than any other now available. It offers group pre-payment to subscribers, group practice for physicians, with good hospital and outpatient facilities as an integral part of that practice, and the broadest coverage in terms of services to subscribers and their families. As the Plan now operates, it falls short of being entirely satisfactory in two important respects: It is expensive. Subscribers have no voice in policy determination. Good medical care *does* cost money! The Permanente Plan necessarily costs more than the average plan because it makes available more services, a higher quality of care, and use of one of the most modern and best equipped hospitals in the state. Permanente subscribers have access to the most recent discoveries in medicine, some of which were developed under the Permanente Foundation itself. But, with all this, the cost is still higher than the average worker and his dependents can afford. The solution to the problem of cost doesn't lie in doing what other plans have done in the past—which is to make an arbitrary cut in services without consulting subscribers. This obviously does not lower the cost of medical care; it simply forces patients to get care on a fee-for-service basis, which is usually more expensive. The proposal to cut costs without lopping off any services is completely sound. But it is not likely that this can

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be done until enrollment climbs to a much higher figure than it now totals. This climb in enrollment probably has to take place before subscription rates proportionate to earnings can be substituted for the present fixed rates based on family size. One workable solution to apply immediately is to require employers to share the subscription cost. This is the principle fought for by organized labor in current and recent legislation. It is in line with the growing recognition that health is a community responsibility; that protecting workers' health benefits industry as a whole. The principle of employer contributions might well become an operating policy in the Permanente Health Plan, once unions are represented in the policy-making body. Meanwhile, getting employers to share the cost is an objective toward which all unions can work in their contract negotiations.

—*Newsletter*, Northern California Union Health Committee, August 15, 1945.

Unsafe Practices

PREVENTION of injury to health in the handling and processing of chemicals requires a cooperative effort on the part of both workers and management. It is the employer's responsibility to provide all necessary safety measures. These include not only proper equipment but proper maintenance of this equipment and intelligent supervision. Workers, on the other hand, must cooperate in the proper use of the safeguards provided; in avoiding carelessness; in not taking chances; and in paying meticulous attention to carrying out all rules and regulations established for their safety. Unsafe practices on the part of employees which are most frequent causes of industrial accidents and health injuries include the following: (1) Failure to use personal protective equipment which is provided, such as respirators, goggles, leggings, creams, gloves, aprons, safety shoes and the like. (2) Disregard of instructions to remove soiled work garments. (3) Practice of eating and drinking in the workroom, contrary to the posted notice specifically prohibiting it. (4) Failure to wash hands contaminated with poisonous chemicals; wiping them on handkerchief or clothing instead. (5) Practice of washing hands with lacquer thinners in defiance of rules prohibiting such practice. (6) Disregard of rules requiring regular baths, or the frequent washing of hands, face and hair. (7) Failure to change from regular clothing into suitable work clothing, even when this is provided for the purpose. (8) Failure promptly to wipe up and remove from the floor substances of a deleterious nature which have been accidently dropped or spilled. (9) Failure to follow instructions in the matter of entering a reaction or storage vessel without first ascertaining that fumes or vapors of a dangerous nature have been removed; or failure to provide himself with a life-line. (10) Failure to observe regulations prohibiting the storing or pouring of strong acids in close proximity to cyanide plating tanks. (11) Failure to remain at station while engaged in watching a reaction vessel whose contents may boil over if not properly controlled. (12) Practice of blowing a stream of compressed air into a carboy of acid in order to force off the acid; or failure to use the inclinators or siphons provided. (13) Failure to use fans provided in exhaust systems for the removal of toxic airborne contaminants. (14) Insistence upon wearing an inferior respirator rather than one of approved type because the former is more comfortable. (15) Practice of spraying in an open room even where spray booths are provided; or assuming a wrong position in the booth, such as between the object sprayed and the exhaust of the booth. (16) Failure to report defective equipment to superior; or knowingly using such equipment against advice. (17) Failure to blank off pipe lines containing deleterious liquids when conducting repairs on the line; or failure to use metal protective shields in opening an acid line flange.

—WILLIAM J. BURKE, Chemical Engineer, Division of Industrial Hygiene, New York State Department of Labor, "Control of Health Hazards in the Industrial Handling of Chemicals," in *Industrial Bulletin and Employment Review*, June, 1945.

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